REVIEW OF THE FEDERAL AVIATION ACT
(AIR SAFETY)

HEARINGS

BEFORE THE

AVIATION SUBCOMMITTEE

OF THE

COMMITTEE ON
INTERSTATE AND FOREIGN COMMERCE
UNITED STATES SENATE

EIGHTY-SIXTH CONGRESS

SECOND SESSION

ON

REVIEW OF THE FEDERAL AVIATION ACT

JANUARY 11, 12, 13, 14, 15, 19, AND FEBRUARY 23, 1960

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REVIEW OF THE FEDERAL AVIATION ACT

(Air Safety)

MONDAY, JANUARY 11, 1960

U.S. SENATE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
SUBCOMMITTEE ON AVIATION,
Washington, D.C.

The subcommittee was called to order at 10:08 a.m., Hon. A. S. Mike Monroney presiding.

Senator MONRONEY. The Aviation Subcommittee of the Interstate and Foreign Commerce Committee will be in session.

The hearings which we are initiating today are designed principally to review various phases of the discharge of some of the important responsibilities imposed upon several agencies of the Government by the Federal Aviation Act of 1958. The subcommittee will endeavor to continue the hearings during this month of January until we have heard from all interested parties.

I believe it is well to point out that this month marks the first full year of operations of the newly created Federal Aviation Agency and these hearings will give us the opportunity to take an appropriate look at the functioning of the Agency to determine whether any amendments to the act are needed in order to improve the fair and effective execution of the administrative functions of the act.

At the outset, I would like to briefly outline the general subject matters which we propose to examine. They are:

1. Aviation safety;
2. Air traffic control;
3. Air space management;
4. Pilot qualification and certification; and
5. Military participation in the Federal Aviation Agency.

The subcommittee will try to treat each of these subjects separately so as to avoid, if possible, irrelevant diversions from the matter under immediate examination.

Consequently, the hearings today will cover this first phase, namely, the matter of aviation safety, and will continue on that subject as long as necessary. I believe we can set some definite dates thereafter for hearings on the other important topics which I have already mentioned, and I would like to feel that we can complete them by the end of this month.

The increasing use of both private and commercial aircraft by the public as a primary means of transportation makes the question of aviation safety all the more important as time goes on. I would like

NOTE.—Staff counsel assigned to this hearing, Robert T. Murphy and William T. Beeks.

to emphasize that we are not interested in headline hunting or indulging sensational guesses as to the cause of any particular aircraft accident. Rather, we would like to cover this question with all due care and caution, bearing in mind that the public interest can be served only by a diligent check on the record of aviation accidents, both fatal and nonfatal, with a view toward determining just what legislative aid we can furnish in order to minimize air transportation hazards. Indeed, that was one of the motivating factors for our complete overhaul of the Federal aviation statutes in the last Congress.

Simply stated, the cost of aviation safety is eternal vigilance—vigilance beginning with the construction of the airframe, motors, and equipment, and continuing to the final movement of that aircraft on the airways, where volume of passenger traffic now exceeds all other modes of transportation except the automobile.

Needless to say, we have been deeply concerned with the mounting toll of civil aircraft accidents during the past year. From what we know, there seems to be no consistent pattern as to their cause. The Civil Aeronautics Board, under our new statute, has the prime responsibility for the investigation of such civil accidents—whether sustained by private or commercial aircraft—and the sole authority for the conclusions and recommendations based on those investigations. We are fortunate, therefore, to have the Chairman of the Board, Hon. James R. Durfee, with us this morning as our first witness.

Mr. Chairman, we are happy to have you here. We would like to have you proceed in your own way to outline the material that the CAB would like to present.

Senator COTTON. Mr. Chairman, before the Chairman proceeds, I would like to raise one point.

Senator MONRONEY. Certainly.

Senator COTTON. I think the Senator has very characteristically laid out the agenda for these hearings thoughtfully and well, as he always does.

I was somewhat disturbed over the statement made by the chairman to the effect that irrelevant questions will be avoided. One point that has troubled me regarding this agenda is that it appears almost impossible to me, speaking as one member of the committee, to separate entirely, for instance, No. 1, "Aviation safety," from No. 4, "Pilot qualification and certification." It seems to me almost an impossibility to deal with aviation safety without overlapping into one or more of the other areas. I question the chairman as to whether he feels that overlapping can be avoided, and further how strictly he will enforce that rule.

Senator MONRONEY. It will not be strictly enforced, particularly with members of the Committee. Number 4, for example, was made a special item for study due to the fact that two issues in particular have attracted a great deal of attention. The two issues to which I refer pertain to the age 60 retirement regulation applicable to commercial transport pilots and the regulations providing for the automatic denial of licenses to individuals with a history of cardiac, diabetic, or psychiatric conditions.

It is for this reason, and because of the strong demand upon the committee to afford those individuals who object to the subject regulations, among others, an opportunity to present their views before this committee that the subject of pilot qualification and certification will be separately examined. While, certainly, any bearing which such matters as the qualifications, transitional time to the new types of aircraft, various items of general qualification and abilities and certification of pilots have directly and appropriately on aviation safety, should be brought out in the hearings which we started today. It was merely to try to not confuse or burden the record that testimony on the regulations in question will be heard separately.

Senator COTTON. I thank the chairman for his explanation.

Senator MONRONEY. I do hope we can confine most of the evidence to those matters appropriately related to the safety feature at the outset of the hearings.

You may proceed, Mr. Durfee.

STATEMENT OF HON. JAMES R. DURFEE, CHAIRMAN, CIVIL AERONAUTICS BOARD; ACCOMPANIED BY ALAN S. BOYD, MEMBER, CAB; OSCAR BAKKE, DIRECTOR, BUREAU OF SAFETY, CAB; ROSS NEWMANN, ASSOCIATE GENERAL COUNSEL, CAB; AND BEN ASHMEAD, ASSISTANT CHIEF, SAFETY ANALYSIS DIVISION, BUREAU OF SAFETY, CIVIL AERONAUTICS BOARD

Mr. DURFEE. Mr. Chairman, the Civil Aeronautics Board is here this morning, at the call of your chairman, Senator Monroney, to report to the Congress on the air safety record for 1959. As always, it is a pleasure to report to this committee.

May I at this time introduce the principal representatives of the Board, whom you may wish to call upon during our presentation?

I am pleased to introduce as one of our new members Mr. Allan S. Boyd, of Miami, Fla., who joined us on the 15th of November. Mr. Boyd?

Mr. BOYD. Good morning, gentlemen.

Senator MONRONEY. I understand Mr. Boyd is a B–17 World War II pilot; is that correct?

Mr. BOYD. Yes, sir.

Mr. DURFEE. I might say he has taken a very keen interest in the submission of this report to the committee.

Mr. Juliana, the Executive Director of the Board.

Mr. Bakke, the Director of the Bureau of Safety.

Mr. Newmann, the Associate General Counsel for Rules and Legislation; and my own legislative legal assistant, Mr. Robert Lester.

We have other representatives of the Bureau of Safety here, who may be called upon from time to time.

Senator MONRONEY. Would you like to go through your full statement before pausing for questions?

Mr. DURFEE. I would. I may condense my statement, and I may add some interpolations.

Since the statement was prepared I might say I have some additional comments.

I would like if possible to complete my statement.

Senator MONRONEY. All right.

Mr. DURFEE. We want to express our particular appreciation that the committee has turned its attention to this problem so promptly in this very busy session—because we believe that it is of vital importance to clarify the 1959 record for the Congress and the public.

The Board is here reporting to you today as the Congress' monitor of the air safety record, which derives from the Board's duty under title VII of the Federal Aviation Act to investigate accidents, to determine the causes of those accidents, and to recommend remedies that will avoid future accidents.

The regulatory and other administrative actions taken during 1959 are, of course, the province of the Federal Aviation Agency under Mr. Quesada who, I understand, will report on the activities of his Agency following us in this presentation.

The first year under the Federal Aviation Act—1959—was a milestone year in aviation, and in airline operations in particular. Jets were introduced to the American traveler in significant numbers in 1959 by several airlines—and, I might add, without a single fatality in jet-scheduled operations. Turboprops were introduced in even greater numbers, including a substantial number of F–27's in local service operations—the first new type aircraft introduced on the American scene by local service carriers.

Airline passengers grew in numbers by over 18 percent in 1959, over 1958, to a tremendous new high of close to 58 million passengers, who traveled a total of over 37½ billion passenger-miles.

At this point, Mr. Chairman, I might interpolate that I am going to give some general statistical conclusions. At the conclusion of my presentation I hope to present to the committee an analysis of what I think is a very extensive compilation of all significant data in this field.

In short, in 1959 the airline industry carried a vastly greater number of passengers a greater distance than in any year in history—and carried many of those passengers on entirely new types of equipment that are far faster, far bigger, far more expensive, and far more complicated than any in history—in airspace that is far more crowded than at any time in history.

This growth was not achieved without growing pains. The accidents and their causes have both been matters of grave concern to the Board out of our continuing concern both for the traveling public and for the health and soundness of the vital national asset that our air transportation system is today.

In point of fact we, both the CAB and FAA, sometime ago began to give this problem special attention over and above the continuing attention inherent in the Board's investigation process.

When the 1959 statistics began to take on a meaningful appearance, we so advised Mr. Quesada and received an immediate and most cooperative response.

In recent weeks Mr. Quesada and I have met on several occasions to review the record personally and to assure that all necessary action was being taken. The Board and its staff met with Mr. Quesada and his staff for an extensive review of the 1959 record.

Mr. Boyd, in that case, represented the Board in that particular conference because of the particular interest which he has evidenced in this record.

In addition, CAB and FAA staffs are continuing their cooperation and special efforts to improve this record. The specific results of these special conferences, that is, the action which is taken, I shall leave for Mr. Quesada and the FAA to outline for you.

I do want to take this opening to point out, however, that the Board has received the utmost cooperation from Mr. Quesada and his agency not only in this particular matter but generally in the conduct of the Board's work.

The relationships between these agencies are excellent.

Mr. Chairman, I would like to interpolate at this point a personal reference, though this is not a time for personalities.

During the past year, from my own observation and contact with the Federal Aviation Agency, I have reached the conclusion, which I am sure is shared by many people, that the Administrator, Mr. Quesada, has probably been given the most difficult job in the world of aviation today.

He has met this tremendous challenge with rare courage and dynamic force. I think the principal concern of this committee, Mr. Chairman, back in 1958, was with the tremendous conflict between the military and civil aviation over control of the airspace and air travel control.

We are all familiar with the very substantial record which has been accomplished within 1 year in that area, the excellent coordination and cooperation which have been recieved, I would say for the first time, in the area of solving a common control of the airspace of this country, and with progress in research and development, improvements in air travel control.

This has been a gigantic task. But if it can be identified with the name of one person, I would like to say that the esteem and respect which the Civil Aeronautics Board has for Mr. Quesada would compel us to identify this one person in the person of Pete Quesada.

I have called your attention to these special conferences between CAB and FAA to assure you that the growing pains of this dynamic industry are receiving unparalleled attention to eradicate its causes. In this context I should next like to outline some of the statistical details concerning the 1959 record.

As I said, we will present a complete statistical compilation which we have here, and analyze it for you.

In carrying the record volume of 57 million passengers over 37½ billion passenger-miles, the scheduled airlines had 66 accidents, 9 of which involved fatalities, totaling 257 passengers and 37 crew members—for a passenger fatality rate of approximately 0.68 for every 100 million passenger-miles.

To put this rate in perspective of the experience of earlier years, we have prepared some charts which I would like to display to the committee at this point—charts that reflect the fatality rate by showing the fatalities in terms of the total exposure.

The first chart "Airline passenger miles and passenger fatality rates, 1938–59, scheduled domestic international operations," may I say to the committee that when we refer to statistics we would ask that very careful attention be given to the classification.

When we refer to a certain number of accidents of one type of operation I think we will have to identify them. This is passenger

miles and passenger fatality rates, airline, scheduled domestic and international operations.

Mr. Ashmead?

Mr. ASHMEAD. This chart shows the passenger miles flown since 1938, beginning with approximately one-half billion passenger miles in 1938, and progressing to the point of 37.5 billion in 1959.

The passenger fatality rate up here will show in 1938 a rate of over 5 per 100 million passenger miles flown. This has consistently, with peaks and valleys, gone down until we hit a low in 1954 of 0.07 passenger fatalities per 100 million passenger-miles.

We had a slight upturn in 1955, down in 1956; and it continued down in 1957, following which a slight upward curve has been taken until in 1959 it is 0.68 passenger fatalities per 100 million passenger-miles.

Of course, you will realize that the scales are considerably different, this being in units of one, and this being in units of billions.

So the spread would be tremendously higher than you see here. Are there any questions, sir, on that?

Mr. DURFEE. Mr. Chairman, I might say that we will later refer to rather extensive compilations which are on the desk for each member. Both these charts and the statistical tabulations from which they are prepared, copies are in this information which will be distributed to the committee.

Mr. ASHMEAD. The second chart relates to the number of passenger fatalities in each year of the 1938 period through 1959 in relation to the passenger fatality rate——

Senator MONRONEY. Because the guests of the committee and the press cannot see the charts, I would suggest that once you have exhibited them, you might make them available to the press table and to someone who might like to show them to people in attendance here.

Mr. ASHMEAD. Yes, sir.

Again we will see—in 1958, of course, the number of passenger fatalities was rather low. As you will see, the number of passenger fatalities has progressed up pretty high, but the rate concurrently has been down.

We now have the highest total in the history, the annual history, of 257 passenger fatalities in 1959. However, again we will see the rate of 0.68 passenger fatalities per 100 million passenger-miles. This illustrates so definitely the tremendous increase in exposure, at the same time with the rate being held below a level of 0.1 for the past 8 consecutive years.

As I say, the low point was in 1954 when we had 16 passenger fatalities out of a total of 35 million carried, which is something we hope to achieve again.

Are there any questions?

Senator COTTON. This is based on number of passengers? The first chart was the number of miles?

Mr. ASHMEAD. No, sir. This is the number of passenger fatalities in each year, and the other chart was the number of passenger fatalities in relation to the number of passenger-miles flown.

This does not show the number of passengers carried.

Is that clear, sir?

The next chart relates to our general aviation operations.

Mr. DURFEE. I would like to say, gentlemen, I am sure the committee is familiar with this, by general aviation we mean all civil air carrier operations except airline operations.

Mr. ASHMEAD. That is correct.

Senator MONRONEY. This includes air taxi service—charter service, the private flyers, and that type of flying? Everything except the certificated scheduled passenger airlines? Is that correct?

Mr. ASHMEAD. It does not include the supplemental carriers. This includes everything apart from air carrier operations, per se?

Senator MONRONEY. Does this include cargo?

Mr. ASHMEAD. This would include commercial cargo, but not airline cargo.

Mr. DURFEE. Mr. Chairman, general aviation includes everything but airline operation, whether it is scheduled or nonscheduled.

Mr. ASHMEAD. That is correct.

Senator COTTON. As well as passenger and freight?

Mr. DURFEE. Yes, sir.

Mr. ASHMEAD. Instructional or pleasure, yes, sir.

This chart shows that in 1938 we had fewer than 200 million plane-miles flown. It shows in 1959 we went to approximately 1.5 billion plane miles flown in general airline aviation.

The chart also shows the rate of approximately 13 accidents per one million plane-miles flown in 1938, dropping down to approximately three in 1959.

The fatal accident rate was at this area here in relation to here [indicating], in 1938, coming down to approximately 0.3 per million plane miles flown in 1959, which shows a dramatic increase in safety. Of course after you get on these lower levels, 0.5, 0.4 it is pretty hard to bring it down below that particular curve.

Senator ENGLE. Do I understand that this graph shows that the fatality rate per passenger-mile in general aviation is less than it is in commercial aviation?

Mr. ASHMEAD. Oh, no, sir. This is based on fatal accident rate, not on passenger fatality rate, inasmuch as it is well-nigh impossible to get precise figures on the number of passengers carried nor the number of passenger-miles flown in general aviation operations.

Senator ENGLE. I do not understand the difference. You kill them all when you have an accident with one of those big airplanes, usually.

What I want to find out is how this relates to the safety record of the airlines.

Mr. ASHMEAD. Over the past number of years we have found a fatal accident rate on the scheduled airlines in their passenger operations of approximately 0.17 per 100,000 hours of flight. The corresponding rate for general aviation is approximately four. That will give the——

Senator MONRONEY. Four or four-tenths?

Mr. ASHMEAD. Just four. Four per 100,000 hours flown. Whereas in the airlines it is about 0.14.

Senator ENGLE. What was that 0.6 that you had?

Mr. ASHMEAD. 0.68, sir, was in relation to the passenger fatality rate per 100 million miles flown, or, in other words, a passenger-mile being one passenger carried 1 mile. He can fly approximately almost

200 million passenger-miles before the average would be for his death, so to speak.

Senator ENGLE. You are putting quarts and pounds together and coming out with miles.

Let's get these on a comparable basis.

Mr. ASHMEAD. We do not have a large chart here showing the hours flown in general aviation operations. However, I do have those statistics.

I was putting this on the basis of——

Senator ENGLE. What is the passenger fatality in the airlines per hour flown?

Mr. ASHMEAD. We do not use such a statistic because that statistic does not add up to very much, simply because you do not know how many passengers there will be in an airplane. One airplane can fly—I don't know how many hours—with two passengers. Another airplane can fly with a full load the same number of hours. So there really is no good index basing passenger fatality rates per 100,000 hours flown.

Senator ENGLE. There is not any way then to accurately compare the safety record with commercial airlines and general aviation?

Mr. ASHMEAD. On the hour basis; yes, sir.

Senator ENGLE. You say you don't have that statistic?

Mr. ASHMEAD. I did not say that, sir. I said we do not have the statistic of the passenger fatality rate per 100,000 hours, for example.

We do have the fatal accident rate per 100,000 hours. We have that for both air carrier and general aviation operations.

Senator ENGLE. But you start out with a DC–7 and you have 40 people on it. They fly an hour. That is 40 passenger hours for every hour up. Whereas some fellow who might be flying a duster would have 1 passenger hour?

Mr. ASHMEAD. Yes, sir; but the operations are different.

In other words, we have certain segments of general aviation, for example, business flying, which stacks up very well in relation to hours flown and the air carrier operations themselves but we do not have precise information on the number of passengers carried, so we cannot make that particular comparison.

Senator ENGLE. I understand. Thank you very much.

Mr. ASHMEAD. Are there any further questions?

Mr. DURFEE. I believe the difficulty there, Senator, as I understand it, is that we do not have the total passenger-miles that are flown in general aviation in the compilation of our statistics.

Senator ENGLE. I understand that. The gentleman made it very clear.

Mr. DURFEE. During the 22-year period 1938 to 1959, covered by these charts, the number of passengers carried in all scheduled operations has increased from approximately 1½ million to 58 million per year, an increase of approximately 40 times.

The passenger-miles flown have similarly increased from 614 million to approximately 37½ billion, or approximately 63 times, over this 21-year period.

By these or any other tests it is obvious that the exposure to accidents has increased tremendously over this period. When comparing the gradual increase in the annual accident totals and in the passenger

fatality totals over these 22 years, with the great increase in total air carrier operations, we find that a general and substantial improvement in the safety record has been achieved.

Unfortunately, however, after a steady decline in the accident rate over the years, during the past 3 years the fatality rate has increased somewhat, as this chart demonstrates.

I should like to leave no doubt in the committee's mind that the decrease in fatality rates over the years to less than one per 100-million passenger-miles—a long-sought goal that was first achieved I believe in 1952 and has continued to date—has been a notable achievement of which the country and the airline industry may continue to be proud.

Nevertheless, neither the industry nor the Government can afford to ignore the trend that appears to be indicated in recent years.

In absolute numbers—if we ignore the increased exposure that accompanied the growth of the industry—the number of accidents and the number of fatalities in 1959 were the largest experienced by the industry in any 1 year. There can be no complacency about these figures either—although, when viewed, for axample, against the record of this industry in the early postwar years, perhaps down to 1952, the 1959 figures take on a somewhat different color.

In those earlier years, an industry only one-quarter the size of today's experienced almost as many accidents (64 in 1948), the second highest number of fatalities (249 in 1947), and even more accidents involving fatalities (11 in 1946).

Mr. Chairman, I wish to reiterate that I have tried to give the committee this perspective on the 1959 record solely to assure the committee that from a statistical standpoint, in terms of the scope of airline operations, the 1959 record is not extraordinary, as it might seem at first glance.

From whatever standpoint we look at it, however, it must be made better.

Helping to make that record better is, of course, the purpose of the Board's accident investigation work. The Board is investigating all of these passenger accidents—plus the ones that occurred during 1959 in all-cargo services, in training operations, in other nonscheduled or nonrevenue operations and nonairline operations. We have issued formal reports on a number of these accidents. Copies of these reports are furnished to the committee in the information to which I referred. Others are still in the process of investigation. We have also made numerous less formal recommendations and reports as an outgrowth of our investigations, copies of which are also being furnished to the committee.

I know, however, that this committee is interested in more than the bare statistics, and more than individual reports and recommendations. You are particularly interested, I believe, Senator, in knowing whether there is any pattern of any special problems discernible in these accidents, and particularly in 1959.

Generally speaking, on the basis of our work to date, we think the answer to that question is "No." In this connection, I want to call your attention to the fact that the year 1947—also a peak year in accident fatalities—was plagued with many problems similar to those the industry faced in 1959; if we go back 12 years, we find many of

the same problems. Both 1947 and 1959 were years of considerable change, dramatically marked by the introduction of radically new aircraft types operating in markedly different environments. In 1959 it was the jets and turboprops; in 1947, it was the Constellation, the DC–6, and the other, postwar, pressurized aircraft.

In neither year was the adverse safety record attributable entirely, or even substantially, to the noval problems directly associated with the introduction of new aircraft types. If there is any lesson to be learned from the record, it is that the classic problems of aviation safety never completely disappear in any year.

From 1956 to 1958 there were incidents that did focus attention dramatically on one particular aspect, one special problem of air safety; namely, the mid-air collision, which focused attention on the problem of facilities and airspace utilization. During 1959 there were no mid-air collisions in air carrier operations.

There was no other single factor that can be focused upon. Rather, the historic problems reappeared to focus attention on the fact that safety is the product of day-by-day attention to the myriad of details of airline operations and to painstaking investigation of every slip, every incident and every accident.

We think this is true despite some deceptive appearances to the contrary. For example, an examination of the Board's statistics for 1959 might suggest special problems with instrument approaches—since several of our fatal accidents in 1959 occurred during instrument approaches.

Although our investigation of some of these accidents is not yet complete, in each case our investigations have disclosed conditions that may have caused the accidents that had nothing to do with approaches or facilities.

If there is a special problem disclosed by the 1959 record, it is simply this: that renewed and increased attention must be given to the fundamentals of safety—to careful training, careful maintenance and careful operations in general.

Since the introduction of the DC–3, the considerable change in civil aviation has had a pronounced effect on the accident investigation function. Today's transports may operate at speeds four times as great as that of the DC–3. Maximum weights have increased from approximately 25,000 pounds to more than 300,000 pounds. Today's aircraft carry fuel which alone will weigh 150,000 pounds. They have many times the footage of cable, wire, and tubing and many times the number of electronic, mechanical, and hydraulic components. The engineering man-hours involved in the development of the DC–8, for instance, are approximately 35 times that of the D–3 and the cost of the aircraft approximately 60 times.

These are but crude measures but they suggest eloquently that the investigation task of today requires an even greater effort and a more scientific approach than ever before. An accident today is very apt to occur at an altitude such that ground witnesses will not be able to furnish important details. The plane is apt to burn far more completely than in the past, the wreckage, to be scattered over a wider area, to include a larger number of critical components, facilities, and services, and the accidents involve a larger investment, a far larger number of passengers and, therefore, a more in-

tense public interest. It was largely our recognition of the character of today's accidents that prompted the promulgation of the flight recorder requirement in 1957. However, our experience of the past year strongly indicates the need for a substantially enlarged flight recorder program. This we are currently exploring with the Federal Aviation Agency and we reported this publicly in the report issued yesterday on the accident at LaGuardia Field.

Senator MONRONEY. May I interrupt here. As I understand it, today you require only airplanes flying above 25,000 feet to carry flight recorders, and that those flying at lesser altitudes are not required to carry them; is that correct?

Mr. DURFEE. Aircraft certificated above 25,000 feet.

Mr. BAKKE. That is correct. Certificated for flight above 25,000 feet.

Senator MONRONEY. The cutoff is below 25,000 feet?

Mr. DURFEE. Mr. Bakke, I think maybe it would be appropriate to explain briefly what a flight recorder is, the particular type of flight recorder that we have here, which is not the only recording instrument in the cockpit, but a report of the characteristics of the aircraft in flight.

Mr. BAKKE. Sir, the Board had initially required a flight recorder in aircraft back in 1942. Because of the war it was impossible to obtain parts and otherwise to maintain these flight recorders in satisfactory operation. So the requirement for a flight recorder was rescinded in 1943, with the Board's announced intention of reinstating the requirement after the war.

After the war, however, a series of investigations were instituted in order to obtain a superior flight recorder, on the basis of which the requirement could be rewritten. Efforts in this direction were largely unsuccessful.

Finally the Board insisted that irrespective of the disagreement in the industry on the nature of the flight recorder requirement, that modern aircraft had reached such complexity, were entering new environments and that the flight recorder, therefore, had to be required to record at least five parameters. That is now part of the Civil Air Regulations.

These parameters are now direction, altitude, speed, G forces, against time. These five parameters are now required to be provided for in a flight recorder for aircraft flying above—that is, for aircraft certified to fly above 25,000 feet. The reason for this limitation was that at the time the Board reinstated the requirement it announced that it intended the requirement to be applicable to aircraft that were flying in substantially new environments. It therefore used this criterion as a means for distinguishing the jets from all other airplanes, because these aircraft were sufficiently large, were sufficiently expensive, flew sufficiently fast and sufficiently high that the requirement on these aircraft appeared to be clearly justified.

Because there was sufficient doubt in the Board's mind with respect to other aircraft operation, at that time the Board decided not to apply the requirement. Since that time, however, it has appeared increasingly, as we get into our investigation problems, that justification exists also for other aircraft types. This is the exploration which is

now going on with the Federal Aviation Agency, recommendations already having been transmitted to that Agency by the Board.

Senator MONRONEY. Two of the most difficult accidents of the past year, or coming over into early this month, were explosions in midair of conventional types of aircraft at about 18,000 feet, were they not? So undoubtedly the state of the art of these recorders has reached a point where once recovered they could indicate stress, G forces, and others—it would be helpful to know the cause of those midair explosions, would it not?

Mr. BAKKE. Sir, I think that there are very few accidents in which the flight recorder would not be helpful. I think it could be said generally that the flight recorder would be helpful in all accident investigations. There is a difficult test, of course, to apply with respect to economic justification. I would say generally, sir, that I would agree with you with respect even to conventional aircraft.

Senator MONRONEY. Is it not a fact, also, that from every investigation that you make of a fatal accident, that where you are able to retrieve enough of the airframe with the engines and instruments or other things, such has inevitably led to great corrections in the airframe or engines or other possible failures of design of such aircraft and that immediately planes are modified to eliminate these dangers?

Mr. BAKKE. Generally speaking, sir, I think that is correct.

Senator MONRONEY. So the evidence is the most important thing that we can have, and the fuller the evidence, the greater the chances are of promoting safety by requiring whatever changes are necessary.

Mr. BAKKE. I believe so.

Senator ENGLE. Would the chairman yield?

Senator MONRONEY. Yes.

Senator ENGLE. What do those recorders cost?

Mr. BAKKE. I don't think I can give a precise answer to that, because the cost has varied considerably. I think I might give, say, a ballpark estimate. It began, my recollection is, somewhere in the neighborhood of $6,000 per copy, installed, and has gradually come down somewhere in the neighborhood of $4,000. I would suggest if a more precise figure is desired that one might check with the FAA, who would have more exact figures, or we could provide a more precise figure.

Senator ENGLE. What does the 707 cost?

Mr. BAKKE. In round numbers, $6 million.

Senator SMATHERS. Mr. Chairman?

Senator MONRONEY. Yes, sir.

Senator SMATHERS. Of the fatal accidents which you have had, what percentage of them have been in aircraft that are certificated to fly at less than 25,000 feet?

Mr. BAKKE. For the year 1959, for instance, by far the larger percent, so far as fatal accidents, total fatal accidents in large aircraft is concerned, I would say about 95 percent.

Senator SMATHERS. So if flight recorders are actually going to provide much information—of course, we know the picture will change as we carry more people on the jets—it would seem to require their installation in planes which are certificated for less than 25,000 feet?

Mr. BAKKE. This is an indication that has become more and more apparent to us; yes, sir.

Senator SMATHERS. How soon would you say this would become a firm requirement?

Mr. BAKKE. Sir, I am afraid that question should be directed to the FAA, since the Board itself does not promulgate the requirement. A recommendation to that end has already been transmitted to the FAA.

Senator MONRONEY. That is for all passenger-carrying transport aircraft?

Mr. BAKKE. No, sir. If I recall correctly, the recommendation was in terms of all turbine-engine aircraft.

Senator MONRONEY. It would still leave your reciprocating prop-driven engine.

Senator SMATHERS. What about the piston engines?

Mr. BAKKE. As far as the recommendation that was made, it would still leave it uncovered.

Senator SMATHERS. Don't you think from the record thus far the indication is that most of these accidents are occurring and probably will occur—you know more about these planes, but we don't know apparently what happens, for example, with the two National Airlines planes which recently went down, one over the gulf and one here in North Carolina. Is it not a fact that a flight recorder on either one of those—certainly on the plane that was recovered in North Carolina, parts of it—would have given you some indication of what did happen?

Mr. BAKKE. I believe it would have provided very valuable information. As I indicated before, I personally would like to see flight recorders on all airplanes.

I believe the Senator touched upon, however, at least part of the basis for the Board's justification, where you were balancing very large costs for aircraft against the cost of a flight recorder, the justification becomes easy. As the cost for the flight recorder becomes an increasing percentage of the total value of the aircraft, the need for justification mounts. Somewhere the justification begins to become difficult. We think a good case can be made for aircraft other than turbine engine aircraft, but with increasing difficulty.

Senator SMATHERS. You say a good case can be made for all other aircraft, but you have not recommended it for all other aircraft; is that correct?

Mr. BAKKE. Yes. And the reason for that is that we think the case for all turbine-engine aircraft is so good now that we should proceed immediately. With respect to the rest of it, perhaps we can explore this further. But we believe that there should be no delay in getting on with the program as far as all turbine-engine aircraft are concerned.

Senator SMATHERS. What percentage of your fatal accidents in 1959 occurred in turbine-engine aircraft?

Mr. BAKKE. There were one-third.

Senator SMATHERS. One-third?

Mr. BAKKE. Yes, sir. Three of the nine fatal accidents in scheduled domestic passenger operations, for instance, were turbine-engine aircraft—two Electras and one Viscount.

Senator SMATHERS. So you expect to recommend that a third be covered but to leave two-thirds uncovered on the basis of cost?

Mr. BAKKE. I believe, sir, the committee should focus its attention on the fact that the trend toward these turbine-engine aircraft is a rather sharp one, that 1960 should see a far greater percentage of our total number of passengers carried in turbine-engine aircraft. If we can get on right now with the turbine-engine fleet, we will be covering a portion of the fleet which will be increasing in importance so far as the total carriage of passengers is concerned. That, I believe, we should take care of right now.

Senator SMATHERS. In other words, you are saying your order requiring the turbine engine and those certificated above 25,000 feet, by reason of the way the development of aircraft is going—in that airlines are buying turbine-powered planes rather than the old piston engine—that in the immediate future there will be a breaking point where that will cover actually most of the planes in operation?

Mr. BAKKE. Exactly correct, sir.

There is one other point of which we should not lose sight, and that is it has long been our opinion that the flight recorder—perhaps not necessarily the device as we today know it, but the flight recorder as a principle—is able to make a very valuable contribution to air carrier operations quite apart from accident investigation, especially where we are dealing with operation of aircraft in new environments. The unknowns can be better measured, better evaluated by a precise flight recorder. It is our view that this type of need is greatest in the turbine-engine fleet.

Senator COTTON. Will the Senator yield?

Senator SMATHERS. Yes.

Senator COTTON. At this point, for the benefit of some of us whose experience on this committee is rather recent, could you in a few brief sentences, designed to be understood by a high school sophomore, perhaps, give us a picture of this flight recorder, what it is and how it functions? You have been assuming that we know that. I think some of us may not know it.

Mr. BAKKE. The principles of design and operation of the flight recorders differ because different techniques are applied to solve the flight recording problems. Very simply the Board requires that some record be developed in the aircraft capable to be used in postflight analyses, and so designed as to withstand high impact forces and high temperatures, in case of an accident, to cover the five parameters which I stated earlier—which I described earlier.

Senator MONRONEY. Give us the parameters again.

Mr. BAKKE. Air speed, altitude, "G," direction, and time.

Mr. COTTON. So after an accident, when you investigate, if this recorder has not been destroyed, if it has withstood the heat, the impact, and the rest, you know up to a certain point the facts about that flight, how high they were, how fast it went, what direction and so forth?

Mr. BAKKE. Exactly. One recorder, in common use today, for instance, accomplishes this by inscribing a curve on an aluminum foil which indicates changes in any of these five parameters. This may be measured after a flight, it may be plotted against time, and the flight reconstructed with surprising precision. If the committee were interested in exploring in this particular problem in detail, I might refer to the reports of the analysis of the flight record under some very difficult circumstances in connection with the investigation of

the 707 accident at Peconic Airport in Long Island. The amount of data which was obtained from the flight recorder was surprising, to say the least, and extremely useful in the investigation.

Senator COTTON. You have just said that these flight recorders would be of value for other purposes in the investigation of accidents.

Mr. BAKKE. Yes, sir.

Senator COTTON. Give us one example of that.

Mr. BAKKE. Well, sir, an aircraft flies through severe turbulence. There is a good deal of subjective evidence of turbulence, frightening passengers, perhaps even hurting some of them. The crew may be somewhat disturbed about this turbulence. When the aircraft lands, the question is raised, how great was this turbulence; how significant was it so far as the airworthiness of the aircraft is concerned. The operator is left with a subjective evaluation of the opinions of the crew and other occupants of the aircraft. It would appear, and it has appeared to us, that some tangible record of speeds, changes in altitude, the "G" forces that were imposed on this aircraft, would be a valuable adjunct to the other sources of information on the basis of which a more comprehensive inspection of the air frame could be accomplished.

Hard landings is another problem which is of a similar type. There are many operational analyses, it appears to us, that could usefully be made, and certainly as we are approaching an age in which the process of automatic data collection and data processing is becoming a very valuable tool of industry, it would appear to me that this has a good application in air carrier operations as well.

Senator MONRONEY. Would you yield?

Senator COTTON. Yes.

Senator MONRONEY. I understand that there is now in use on some of the jets, a great many of them, certain types of these recorders that will have up to 30 inputs of flight analysis. Does this go beyond the five that are required?

Mr. BAKKE. Yes, sir. Several air carriers have recognized the value of a flight record for reasons other than those indicated in the regulations. There are, for instance, electronic and magnetic tape recorders which provide a very large number of channels, and which are capable of recording a very large number of parameters other than those indicated. Things like engine temperature, for instance. With a propeller driven airplane it is not a difficult chore, engineeringwise, to establish such things as a propeller pitch, revolutions per minute, and factors of this sort are very valuable to an investigation. This is much more difficult so far as a turbine-engine aircraft is concerned. And we become increasingly dependent on other sources of information. The recording of things like engine temperature would be valuable here, we believe.

Senator MONRONEY. Are any of these subject to recording the possibility of metal fatigue, involving high pressurization and continued use, for example, of pressurization in older aircraft?

Mr. BAKKE. I know of no such techniques, sir.

Senator MONRONEY. That would have to be caught in the inspection period that the plane regularly goes through?

Mr. BAKKE. That would be my view, sir.

Senator SMATHERS. Mr. Chairman, may I ask this question: When an aircraft company brings out a new model of an aircraft to sell it to the industry, and the industry buys it, we will say, to put into use, does the CAB or the FAA now require that there be put on that new, say, prototype, or is there as a practical matter on the prototype, some kind of an air recorder of this nature that you are talking about which, before it is put into use, demonstrates what stresses and strains the airplane can take? Do you have that kind of information?

Mr. BAKKE. Sir, the Civil Air regulations, on the basis of which an aircraft type is certificated, has very very many requirements that go to the airworthiness and performance of an aircraft. And in order to be certified by the Administrator, it is necessary that the manufacturer demonstrate compliance with all of the requirements of the Civil Air regulations. To do this, he must fly the airplane in certain operations defined in the airworthiness parts, and he must record in great detail the response of the aircraft to maneuvers required.

The total amount of recorded record which is compiled by the manufacturer through this certification process is, in my opinion, staggering. There is a tremendous amount of detailed information.

Senator SMATHERS. My question then would be this: How do you make a determination, except by these subjective tests which you a moment ago said sometimes are not too accurate, as to some man's belief that you were subjected to so many "G's" or that the plane could take so much stress and strain at this angle. It may be that on a given day one might believe it will do this or that and on another day the same person might have a different opinion. Would it not be more accurate and helpful to have this machine installed in those prototype planes so that in fact you could see accurately what it was the plane could or could not do? I am just wondering why that has not been done.

Mr. BAKKE. To the extent that the operation of the prototype is required for purposes specifically described in the Civil Air regulations, such recording is done right now.

Where the operation of the prototype is for reasons not compelled by the regulation, but those which are determined by, say, the manufacturer himself, then the Government has not imposed any restrictions with respect to the recording of data. But the data which are required now, I can assure the committee, is very comprehensive, but it is specifically for the purpose of certification.

Senator MONRONEY. How many days of certification did the DC–9 and 707 go through?

Mr. BAKKE. Sir, I don't have that information. This is——

Senator MONRONEY. Were they not testing them over a 6-month period or more, completely instrumented with electronic devices during that period?

Mr. BAKKE. It wouldn't surprise me if it were that long, sir. I just don't have the information. I am sure the FAA people could provide it in detail.

Senator ENGLE. May I ask a question, Mr. Chairman?

Senator MONRONEY. Yes.

Senator ENGLE. With reference to this question of metal fatigue, we know the Comets had trouble. One of them blew up over the Mediterranean and they traced it to fatigue due to pressurization and so forth. That is what the press said at any rate. We had this airplane fall apart here apparently, the other day. Is there any program afoot now, either with your Agency or the FAA, that undertakes to examine into this whole problem of what happens to an aircraft flying say above 18,000 feet, up around 20 to 25 or 30,000 feet, under conditions of heavy pressurization and over a long period of time. Is there anything being done, either by Government or industry, which would give us some intelligence about what is happening so that maybe these cases where airplanes start coming apart will be a little more comprehensible to us?

Mr. BAKKE. I can describe a few things, Senator. First of all I should say so far as any regulatory programs which are underway at the moment, of these I have no detailed knowledge. I am sure that the FAA have certain investigations underway, and I am sure they will be able to furnish this information.

With respect to current research, I might merely illustrate a few of them. The NASA is undertaking considerable research of meteorological conditions at high altitude, such things as the frequency of certain gusts. Clear air gust research in its last few years, has been, for instance, a very important part of NASA research.

In order to obtain the data upon which this research is based, the NASA has undertaken a program of voluntary installation of flight recorders. These, while they do in some respects the same thing that the regulatory required flight recorders do, are different machines for different purposes. They are more precise and they measure the meteorological conditions and the other conditions which are of concern to the NASA.

These are installed on many air carriers today, bringing back data necessary for NASA research.

We believe that in addition to this information there are certain types of large-scale data that can be accumulated, providing that the proper systems are designed with sufficient flexibility for the air carrier to permit large-scale comprehensive data accumulating programs within air carrier operations. This is something that we have discussed with air carriers for a long time. I believe the principal reason it is not undertaken is because the proper machines are not yet with us.

With respect to the problem since the Comet, and as it was carried on up until the time the rule-making function was transferred to the Federal Aviation Agency, I can say that there was a very comprehensive review of this problem accomplished, to the extent that the state of the art enabled the completion of such a program.

The regulations on the basis of which our present jets were designed and certificated in my judgment make almost impossible—although that is perhaps not a proper word to use, but as nearly impossible as we are able to determine—the recurrence or the occurrence of accidents to United States manufactured jet aircraft as occurred, for instance, to the Comet.

These included in the application of certain fail-safe design techniques that prevent the extension of tears in metal or cracks or breaks. They are requirements for redundancy of design so that in the event

of failure of one panel, another takes over the load. In the event of failure of one structural member, there are other members to which the load is then transferred.

These fail-safe principles and design redundancies were entered into the regulations approximately 4 or 5 years ago. And I believe that these are an excellent guarantee against the occurrence in United States aviation of this type of tragedy.

Senator MONRONEY. Would you yield?

Mr. BAKKE. I don't say that we have exhausted it by any means. This is a continuing process. So far as the procedure is being carried on within the FAA I am sure that they would be able to furnish a very comprehensive answer.

Senator MONRONEY. Does the NASA coordinate and correlate their military experiences with high altitude jet flying as compared with the civilian high altitude jet flying? In other words we have had a great many times more flight hours at high altitudes and under various stresses and strains with our jet bombers than we will acquire in several years under the normal operation of jet passenger aircraft. We do know that there have been several evidences of metal fatigue, and consequently some skilled people in the art believe that we have reached a point where there will be a definite lifespan of an airframe. I wonder if this valuable information on the experiences of the military is being correlated to our problems of civil aviation?

Mr. BAKKE. I can only answer that very generally, Mr. Chairman, from my own experience. I know of no data which has general applicability to civil aviation that is developed by NASA, regardless of the source, that is not freely available to civil aviation for whatever useful purpose it may serve. I think that all of this information is normally applied to developments in civil aviation as well. I personally know of no exceptions to this.

Senator COTTON. Mr. Chairman, could I, in order to clarify one point in my mind, violate the request of Chairman Durfee and ask him a question at this time.

Mr. DURFEE. Yes, sir. As far as I am concerned.

Senator MONRONEY. Certainly.

Senator COTTON. Using this recorded matter as a means of clarifying at least in my mind one thing: Before Congress created the FAA, the CAB promulgated the rules relating to these mechanical devices, is that correct?

Mr. DURFEE. Yes, sir.

Senator COTTON. And before the FAA was created, the CAB had promulgated a rule that planes flying above 25,000 feet should be equipped with recorders?

Mr. DURFEE. Yes, sir.

Senator COTTON. Now, under the present setup, CAB having investigated an accident, makes a recommendation to the FAA, and the FAA promulgates a rules and then persons who desire to protest that rule may appeal to the CAB as a review body. Is that a correct statement?

Mr. DURFEE. Mr. Newmann, who is in charge of the subject of regulation, can answer that question.

Mr. NEWMANN. No, sir, there is no appeal to the Board. The Administrator now exercises the safety rulemaking function under title

6, which was previously vested in the Civil Aeronautics Board. There is no appeal to the Civil Aeronautics Board from the rulemaking authority of the Administrator.

Senator COTTON. However, there is an appeal in individual cases on the application of the rule, is there not?

Mr. NEWMANN. There are appeals to the Civil Aeronautics Board with respect to section 602 and section 609 with respect to airman certificates. But there is not a direct appeal to the Board.

Senator COTTON. That has to do with pilots, and not machines; is that correct?

Mr. NEWMANN. Yes, sir.

Senator COTTON. I am trying to get thoroughly in my mind, at the outset of this hearing, how this functions now as between the FAA and the CAB with respect to these mechanical devices the CAB studies the accident, makes a report, suggests the cause of the accident, and sometimes suggests the desirability of a rule. The FAA then has the function of making the rule which, when made, is then final. Is that correct?

Mr. NEWMANN. That is correct, sir. And with respect to the other issues that we talked about a moment ago on the adjudication of 602 and 609, we will be prepared to go into that during the subsequent phases of this hearing.

Mr. DURFEE. If I may put it as simply as I am able to understand it, the FAA has the exclusive power to make regulations. On appeal we can't say this regulation is wrong, or that the FAA should not have made this regulation, or that the FAA should change the regulation. The appeal to the Board in this area goes to the question as to whether, on the record, the FAA, in taking this action, correctly applied the standards which it had under the regulations.

Senator COTTON. And that would be true with respect to these mechanical devices—whether a plane was actually equipped with a mechanical device that satisfied the rule. There would be an appeal on that, would there not?

Mr. NEWMANN. Sir, I would like to distinguish between the safety rulemaking function which was contained in title 6 of the Civil Aeronautics Act in 1938, and again as contained in title 6 of the Federal Aviation Act of 1958. That function, the safety rulemaking function, a quasi-legislative function, was transferred to the FAA. There is no appeal to the Civil Aeronautics Board from a regulation.

Senator COTTON. Just one more question. I want to be sure that I understand this.

Suppose FAA has made a regulation requiring a plane flying in certain areas and under certain conditions to be equipped with a certain type of, we will say, recorder; and suppose that some airline has been found to have violated that regulation or failed to conform to it, and the FAA places a penalty on the line, and the airline is not questioning the regulation but contends that they were actually conforming to it. There is an appeal on that question of fact to the CAB, is there not?

Mr. NEWMANN. Violations of the civil air regulations on appeal are brought to the Civil Aeronautics Board as an adjudicatory proceeding. I might say that when we get into the second phase of this we intend to cover this thoroughly in our testimony. There is an

appeal with respect to a violation in the adjudicatory proceeding, but there is no appeal with respect to the regulation as such.

Senator COTTON. Then the answer to my hypothetical question would be, "Yes," would it not?

Mr. NEWMANN. There is an appeal, but not for the purpose of declaring whether the regulation is valid.

Senator COTTON. I thought I made that very clear. That when the question was not as to the wisdom of the regulation, but whether an individual or corporation had violated the regulation, there is an appeal on that point.

Mr. NEWMANN. Yes, sir.

Senator COTTON. Thank you.

But the appeal is to whom?

Mr. NEWMANN. The appeal is to the Civil Aeronautics Board. The FAA, in the first instance, can either revoke or suspend a certificate, and if the person aggrieved wishes to appeal that, he may then appeal to the Civil Aeronautics Board.

Senator MONRONEY. You are talking about a person. You are not talking about equipment.

Senator COTTON. I am confining this to the subject we are talking about today. I am not talking about pilots qualifications or anything else. I am talking about a rule.

Suppose a rule requires a certain plane flying in a given area under given conditions to be equipped with a certain mechanical device and a penalty was exacted against an airline for flying a plane without that device or with one which was not satisfactory. On the question as to whether the airline complied with the rule or not, would there be an appeal, and if so, to whom?

Mr. NEWMANN. If the airline were charged with a violation of the civil air regulations there would be an appeal to the Civil Aeronautics Board in an adjudicatory proceeding.

Senator COTTON. But not to the courts?

Mr. NEWMANN. No, sir. The appeal could go to the courts after the Board's decision.

Senator COTTON. An appeal to the courts after the CAB?

Mr. NEWMANN. Yes, sir.

Senator COTTON. Could they appeal directly to the courts, bypassing the Civil Aeronautics Board?

Mr. NEWMANN. I doubt it.

Senator COTTON. Thank you.

Senator MONRONEY. I will say it is news to me and the staff that the right of appeal under the Federal Aviation Act on personal rights, individual rights, pilot certification, goes to the Board. The right of appeal on equipment or violation of air safety regulations was transferred from the CAB, from which there was no appeal excepting to the courts, to the administrator of FAA and appeal to the courts on that point still obtains. Am I right on that? Committee counsel who worked on the act for months says that is——

Mr. NEWMANN. May I answer that? The appeal, I think, that you are referring to, is an appeal from a safety regulation which was promulgated by the FAA. There is no appeal to the CAB from a safety regulation, but the appeal, if any, if it were arbitrary or capricious, would lie with the courts. In that case there would be an appeal directly to the courts.

If the Administrator charges a carrier or airman with a violation of a civil air regulation, that is then an adjudicatory proceeding. If they appeal that to the Civil Aeronautics Board there would be an appeal that would be heard by an Examiner of the Civil Aeronautics Board and the Examiner would issue an initial decision. The Board would then issue a final decision and there would then be an appeal from that decision by the airman or the aggrieved party to the courts if they so desired.

Senator ENGLE. His appeal to the courts is not a de novo matter, is it? It is a review of the case within very limited areas.

Mr. NEWMANN. That is correct.

Senator ENGLE. In other words unless they found the action of the Administrator to be unreasonable or capricious, they wouldn't upset it would they?

Mr. NEWMANN. That is correct.

Senator ENGLE. Or unless they found the regulation outside of his authority?

Mr. NEWMANN. That is correct, sir. And we will go into that very completely and thoroughly in our testimony with respect to the fourth phase of these hearings.

Senator MONRONEY. You may continue, Mr. Durfee.

Mr. DURFEE. As I understand, Mr. Chairman, this subject has been set apart under title 4 of the agenda which you set up; and which we are prepared to go into in detail.

Senator MONRONEY. Yes.

Mr. DURFEE. Because of the large number of new aircraft types in use in 1959, we had explored briefly the record of the last year's operations as compared with the history of other aircraft types introduced into air carrier operations within the past two decades. Of 10 typical aircraft types introduced since World War II, 6 were involved in fatal accidents within their first 2 years. It does not appear that our accident experience with new aircraft types during the past year is particularly poorer than previous experience; nor, however, does it appear to be better. The one outstanding aspect of turbine engine aircraft operations which has served to compensate for the novelty with which we are generally confronted is the heartening reliability demonstrated by the turbine engines themselves. It should be noted, however, that for the year 1959 turbine aircraft operations produced only 10 percent of the total number of flying hours for the industry as a whole. The percentage will increase considerably during the next year. Because of their larger size, speed, and passenger capacity, the increase in numbers of passengers carried will be far greater yet.

We also have some observations to make about the general aviation accident record for 1959, although it is somewhat too early to give a full report on the extensive operations of this aviation category. General aviation is the term used to describe all civil aviation operations other than airline—operations with everything from the smallest single-engine to large, multiengine operations, whether they be by student pilots or test pilots, by Flying Farmers, crop dusters, or by executive aircraft. General aviation was represented by approximately 66,500 planes in 1959—an increase of about 4 percent over 1958.

As with our air carrier operations, the total activity in general aviation has increased considerably during the past 20 years. Aircraft flight time has increased from approximately 2 million hours to a total of more than 12 million. Plane miles flown in 1959 in general aviation were approximately 10 times that of 20 years ago. During this period there has been a gradual reduction in both the total accident rate and the fatal accident rate, both having leveled for the past 4 years without significant change.

Even on the basis of our preliminary work with 1959 data, it is apparent that the most important single factor encountered in general aviation accidents involved flight into adverse weather conditions with which the pilot was unable to cope. Approximately 40 percent of the total number of fatalities in general aviation can be attributed to this factor. In recognition of this problem the Federal Aviation Agency has initiated regulatory action designed to correct this deficiency by requiring a minimum familiarity with instruments for all pilots in general aviation.

Since the passage of the Federal Aviation Act we have increased our attention to the investigation of the small-plane accidents in general aviation and we intend to place considerably greater emphasis on the analysis and reporting of the general aviation safety record. This program has not gotten underway as well as we had originally hoped, but with the continued cooperation of the FAA, we do expect to make the improvements in this field that are vitally needed to further improve general aviaion safety.

Mr. Chairman, we have referred to some of the difficulties which we have encountered in investigating small-plane accidents which relate to the inadequacies of personnel to investigate all small-plane accidents. As I recall, Mr. Chairman, at one time you said it was the intention of the Federal Aviation Act that the Board should investigate all small-plane accidents. We find that we are unable to do that. We have been compelled to delegate to the Federal Aviation Agency investigation of all small-plane accidents below 12,500 pounds which do not involve a fatality.

I will skip that detail.

Senator MONRONEY. Before you leave that, you do investigate all small-plane accidents involving fatalities, do you not?

Mr. DURFEE. Yes, sir.

Senator MONRONEY. But an accident washing out a landing gear while coming in, or matters of that kind, you now delegate to the FAA if under 12,500 pounds. What is the cutoff? On twin-engine aircraft?

Mr. DURFEE. No, sir.

Senator MONRONEY. Where would that poundage cut off?

Mr. DURFEE. We investigated C–3 accidents.

It is smaller than a DC–3.

Mr. BAKKE. 12,500 pounds is the cutoff.

Senator MONRONEY. I am trying to get the plane type so that we can readily understand where the cutoff is.

Mr. BAKKE. There are many light twins. For instance, the twin Beech is somewhere in the 8,000- to 9,000-pound class. This is regarded as a small airplane. The Dove is upwards of 10,000 pounds. The first airplane that is caught, of which I have any recollection

now, would be the deHavilland Heron which is above 12,500, about 13 or 14,000 pounds. The Lockheed Lodestar is 18,500 to 20,000 pounds.

Senator MONRONEY. And DC–3?

Mr. BAKKE. 25.2 to 26.8 thousand.

Senator MONRONEY. That is sufficient.

Mr. DURFREE. This discussion on the 1959 safety record, Mr. Chairman, I would like to emphasize some of the conclusions that may well be drawn from this testimony.

The 1959 accident record, while a matter of grave concern and positive action on the part of the aviation industry——

Senator MONRONEY. Mr. Chairman, I believe, because of the importance of the growing general aviation field, that it would be inappropriate for this committee to use that part in the record without it having been read. With the indulgence of the committee—I think they will agree with me—they are as vitally concerned with this part of the record as we are with the commercial though there may not be as many lives lost. It is only fair to our inquiry to ask you to read that portion that you were going to insert in the record.

Mr. DURFREE. What I had proposed to omit—we dealt specifically with the safety problems of general aviation. However, I omitted what we considered the specific problem of the Civil Aeronautics Board in investigating small plane accidents.

Senator MONRONEY. I believe it would help the record if you read that.

Mr. DURFREE. Finally, and before turning to my concluding remarks, I think it may be of interest to the committee to know more about the CAB's role and its problems in accident investigation, at least insofar as these things pertain to our efforts to find the accident causes and recommend the changes necessary to improve safety.

On December 31, 1958, the date on which the Federal Aviation Act came into effect, the Board's safety investigation staff numbered 108, approximately three-fifths of which were professional and the other two-fifths adminstrative-clerical. Under the Civil Aeronautics Act, since January 1, 1954, it has been necessary, as required by the old Civil Aeronautics Act, for the Civil Aeronautics Board to delegate to the Civil Aeronautics Administration the investigation of all nonair carrier accidents involving airplanes weighing less than 12,500 pounds.

It is clear that the Congress intended in the passage of the Federal Aviation Act, and as you, Mr. Chairman, have pointed out, that the Board should conduct all accident investigations required to be conducted by the Federal Government in the public interest. However, since no provision has been made to augment the Board's safety staff at the time the Federal Aviation Act became effective, it was necessary to request the assistance of the Federal Aviation Agency. Accordingly, Public Notice 13, effective December 31, 1958, formally expressed this request of the Board to the Administrator.

In reassessing its investigative capabilities under the Federal Aviation Act, the Board concluded that it would be possible, in addition to its then existing investigatory workload, also to undertake—something we hadn't previuosly investigated—the investigation of all small-aircraft accidents in which fatalities occurred. These repre-

sent approximately 10 percent of the total number of civil aircraft accidents. Accordingly, Public Notice 13 requests the Administrator to investigate only small airplane accidents in which fatalities are not involved. The Administrator is required to report the results of FAA accident investigations to the Board and the Board uses these reports in its determination of probable cause of such accidents.

The Congress appropriated funds for fiscal 1960 for the augmentation of our safety investigative staff, and 19 professional and clerical positions have been added. To date, our technical staff consists of a total of 127 persons, 72 of which are professional and 49 administrative-clerical. Our present staff complement enables the Board to investigate all accidents involving large aircraft, rotor aircraft, and fatal small aircraft accidents. For the foreseeable future, however, it will continue to be necessary, unless additional personnel and funds are made available to the Board, to rely considerably upon the assistance of the Federal Aviation Agency in the investigation of nonfatal small aircraft accidents.

Basing our small aircraft accident investigation activity upon the fatal injury of an occupant is administratively convenient because it avoids the ambiguity, which might otherwise exist between the two agencies, about who investigates what. When a fatal injury has occurred, as of the time of the initial report, the Board investigates; if a fatal injury has not occurred, the FAA investigates. However convenient this criterion seems, it appears that a more useful contribution might be realized by the Board's investigation of a more selective type of accident; for example, accidents which involve structural failure, collision of two or more aircraft in flight, and fire in flight, even though a fatality is not involved. The Board is considering, therefore, whether through such selectivity more meaningful results would be obtained for the purpose of accident prevention and at the same time insure a more efficient use of investigatory personnel.

Senator MONRONEY. In other words, you would continue to investigate a fatal accident, but then you would have a selective investigation where there was suspicion of structural failure, which might be an error in certification of that airframe, or failure of certain type of engines that might be repetitive enough to indicate difficulty. So you would have the warning from nonfatal accidents that could be carried over to perhaps prevent fatal accidents in the small aircraft field?

Mr. DURFEE. Yes, sir.

Senator MONRONEY. I compliment you on that attitude, and as a member of the Appropriations Committee I will certainly help you get sufficient funds for added investigators, because I think it is the lessons we often learn from the nonfatal accidents that prevent fatalities later on.

Senator ENGLE. Will the Chairman yield?

Senator MONRONEY. Yes.

Mr. DURFEE. Mr. Chairman, if I may return the compliment, I would say the Board is heartily in agreement with your statement, that the Board should investigate all aircraft accidents.

That is the purpose of the act.

Senator ENGLE. Do I understand that those accidents are not now investigated?

Mr. DURFEE. These investigated, yes, sir.

Senator ENGLE. What you are saying is that you ought to do it instead of the FAA, is that it?

Mr. DURFEE. Yes, sir. All nonfatal accidents below 12,500 pounds are now investigated by the FAA; they submit a report to us. We are required to find the cause.

Senator SMATHERS. Are you also saying that if by some chance through the intercession of the chairman on the Appropriations Committee and others, I hope, you got a sufficient number of men for an adequate staff, that you would then take this investigation which you have now delegated to the FAA back from the FAA, and that the CAB would then investigate all of these accidents?

Mr. DURFEE. Yes, sir.

Senator MONRONEY. You see, Senator Engle, the procedure is one of checks and balances. Since the FAA makes the air safety rules, runs the airways, certificates the aircraft and the pilots, it was necessary that the check on their performance as well as the airframe etc. be accomplished independently, consequently the investigative duties rest with an independent branch. This is a provision of the Federal Aviation Act which the Congress at least thought was wise. Certainly because of a shortage of funds, it hardly comports with the intent of the act to skip everything except fatal accidents in the general aviation field—which your statistics today indicate constitute some 65,000 aircraft flying and involving greater and greater movements of people each year. For example, within a year or two, you will probably see a vast volume of air taxi work. Reliance of the public on the safety of general aviation facilities is going to either increase and we must improve this vital field of aviation or it can, with inattention to growing nonfatal accidents, be blown out of the water to where it will have no future.

Mr. DURFEE. Mr. Chairman, I think the importance of an investigation of small plane accidents, or accidents in general, apart from airline accidents, while we haven't got it broken down below 12,500 pounds, I think this might put this in perspective. The total fatalities in 1959 in air carrier accidents was 351. The total fatalities involved in general aviation accidents in 1959 was 778.

Senator MONRONEY. That is just the point this committee is concerned with. One life, whether lost in an air carrier or lost in a private plane, is of the same concern. Where you have double the ratio of fatalities numerically, it behooves us and the CAB in charge of air safety to try to find the answers that will improve this record. Obviously—and certainly we have had enough evidence before this committee in the past—it indicates that one of the great causal factors is weather. In this connection we are going to have before us Mr. Reichelderfer, the head of the Weather Bureau, in an effort to determine whether anything can be done to improve the reporting of weather, including the current conditions of weather ahead, for general aviation which does not have its own meteorologists and weather departments.

Senator ENGLE. I would like to suggest, Mr. Chairman, that it seems to me the responsibility with respect to commercial passengers

who fly commercial airlines, is quite different than it is for private pilots. If the latter want to get out there and kill themselves, they ought to be free to do it. I do not believe in hanging too much tinsel around that area of aviation.

Senator MONRONEY. I fly with a number of private pilots, and I am very glad to have certification. I am glad to always feel that we have the latest weather report on the ceilings ahead, on thunderheads.

Senator SMATHERS. You had better not fly with Engle any more.

Senator MONRONEY. From the information which I have received the private pilots want more help, rather than less help. They are quite concerned with nonfatal accidents. Certainly in these cases proper investigation would lead to corrective action which could perhaps save many of the private pilots from burning up in midair—careful investigation would reveal many matters which would otherwise go undetected.

Senator ENGLE. Many of us fly just because we like to. We are not making a business out of it. We are getting to the point here where you have to carry a secretary and a library with you to fly an ordinary airplane. Just try to get out of Washington National Airport with a Piper Cub and see what kind of an experience you have. I am just against that kind of business. I want to make that plain from the start.

With reference to the commercial airlines, I think we ought to do what we can to see that they are protected. But just draping the business, the pleasure, the private, and the sportsman pilot with all these regulations and requirements is pure bunk and it is not in the interest of general aviation to do it.

Senator MONRONEY. We are not talking here about air traffic control particularly. We are trying to talk about the safety of the airframe, the reliability of the engine, the weather ahead, a great many things that I think the private pilots, with whom I have been in contact, desire very greatly. Certainly if the Board needs more money for the investigation of the accidents of private aircraft, I for one certainly am going to try to give them what they need. And I believe it will be generally supported by those who represent the general aviation field.

Senator ENGLE. Let me say this: It is not a question of whether they get the money; it is a question of who has the money. The investigations are currently being made. That is established in this record now. But the FAA makes them, not the CAB. The CAB says give us the money that the FAA has and let us have this investigation all in one place. I am for that. I think it makes sense.

Further than that, I am for investigating nonfatal accidents, because the chairman is certainly right, structural failure, fire on board, particularly those two, ought to be the source of investigation.

Senator COTTON. You can derive more good many times by investigating a nonfatal accident because someone is alive to tell the story. You get more out of it, don't you, Mr. Durfee?

Senator SMATHERS. I don't want to be facetious, but the day will come when we will have to probably hire a psychiatrist and two or three of these mental men to determine when you have these accidents how much of it is pilot error and a matter of human judgment. You people do that now, do you not?

Mr. DURFEE. Sir?

Senator SMATHERS. In the course of your investigations, do you also look into the matter of pilot error?

Mr. DURFEE. Yes, sir.

Senator ENGLE. If they can't find any other cause, they just say it is pilot error.

Senator MONRONEY. You may proceed, Mr. Chairman.

Mr. DURFEE. In bringing my remarks to a close, Mr. Chairman, I would like to synthesize for the committee to conclusions that we think may well be drawn from our testimony, to enable the committee to focus on them in its consideration of the record.

First, the 1959 accident record, while a matter for grave concern and positive action on the part of the aviation community, is not a matter for public alarm.

Second, the 1959 accident record demonstrates the need for continuing attention to the classic problems of safety, as well as the novel ones produced by an advancing technology.

Third, we believe, on the basis of our investigations, that the day-by-day details of airline operations require renewed attention. In this connection, the Board believes that special emphasis should be placed on improved personnel training and procedures, and the need for an effective simulator program.

The FAA has been working on this problem for some time. In the light of our findings in at least two accidents reported in the past year, we believe the industry should be encouraged to give this matter high priority.

I also want to reiterate, Mr. Chairman, the appreciation of the Board for the attention this committee is giving to the air safety record so early, and in a session that, as you have pointed out, will undoubtedly be a short one. We are convinced that the cause of aviation and aviation safety will be well served by the committee's action.

Mr. Chairman, I believe we have a very formidable stack of documents on that table. I think never before in the history of the Civil Aeronautics Board have we presented such a comprehensive and detailed statistical analysis on air safety.

Because of the importance of this information, and the interest and the desire which you, Mr. Chairman, had expressed in having such a compilation, it has been prepared. I might say it is well indexed for ready reference.

We consider it to be a thorough job. Perhaps if you distribute this now I can identify it.

Do you want to take the time to do that?

Senator MONRONEY. It has been presented to the members of this subcommittee. It will be made a part of, not the printed record, but of the files of the committee.

I would like to suggest, respectfully, though, that Mr. Bakke or your accident investigators be prepared at the convening of the session this afternoon, at 2:30, to brief us chronologically on the accidents that have occurred during the year 1959, on factors contributing to their cause, and, if ascertainable, the probable cause of these accidents.

Would that be possible?

Mr. DURFEE. We are prepared to do that.

Senator MONRONEY. I want to compliment you on the very fine statistical study that is incorporated.

Mr. DURFEE. Mr. Chairman, the comments that I made this morning go to the compilation of the statistics in book No. 1. That is the blue book which you have. There are a number of sections. I think they are all identified in the index.

I would like to ask, Mr. Chairman, that this book, which has been the basis of my presentation this morning, be made a part of the record at this time.

Senator MONRONEY. That will be done.

(See page 453.)

Senator SMATHERS. May I ask a couple of questions?

Senator MONRONEY. Yes.

Senator SMATHERS. Chairman Durfee, as I understand it, it is always within the prerogatives of the CAB to make such recommendations to the FAA as the CAB thinks desirable in that those recommendations are designed to improve general safety regulations. Is that correct?

Mr. DURFEE. It is not only our prerogative, Senator, we are required to do it under the act.

Senator SMATHERS. Have you given any thought to this requirement as to how much training a copilot in a specific plane should have in relationship to the training given a first pilot, or the captain?

Mr. DURFEE. Mr. Bakke, the question goes to the training given the copilot with reference to the training given to the captain. Have you given any thought to that?

Mr. BAKKE. Sir, I presume when you ask whether we have given any thought, whether we have given any thought recently in the light of our accident investigation—obviously the Board and its staff has for many years been faced with this question for other purposes, for rulemaking purposes.

I would say that we have, particularly with respect to this last year's accident picture in air carrier operations, attempted—have been on the alert for—any particular indications of deficiency with respect to copilot training that we would consider significant. And there have been no, you might say, unusual indications in this respect.

Senator SMATHERS. Is it or is it not a fact that you require less training, less specific training from a copilot than you do from a pilot?

Mr. BAKKE. Yes. When you say we do, I presume you mean generally in the regulations?

Senator SMATHERS. Generally.

Mr. BAKKE. That is correct, sir.

Senator SMATHERS. Do you think that it might improve safety and that the general public would ride more comfortably if they knew that the copilot, who is called upon from time to time to fly the plane, has in fact had the same type of education insofar as flying the plane is concerned, that the pilot was required to take?

Mr. BAKKE. Well, sir, I certainly believe that any additional training for any crew member, the copilot included, would be well received by the flying public and would have a beneficial effect on safety.

Senator SMATHERS. Why is it then that you do not require that copilots have the same—I recognize they cannot have the same number of hours but the same years of experience?

My information is that the Airline Pilots Association I believe takes the position that you people do not require the copilots to have the same extensive training, the specific schooling, I might say, that you require of a pilot?

Mr. BAKKE. Sir, we do not establish the requirement, as indicated here. The Federal Aviation Agency establishes these requirements.

Senator SMATHERS. But you do have the authority to tell the Federal Aviation Agency, do you not, that you think they should do that?

Mr. BAKKE. Yes, sir; and my answer to a previous question was that with a view toward pinpointing particular problems of training, we have been especially careful in our investigation processes, in the evaluation of statistics, to identify any outstanding or significant problems that would reflect on such a deficiency. And we have not been able to find any that were specially outstanding or significant in this respect.

Senator SMATHERS. Is it or is it not a fact that today it is possible for a copilot to fly copilot in a plane in which he has not in fact been checked out in flight?

Mr. BAKKE. If by "checked out," sir, you mean have an aircraft rating, for instance——

Senator SMATHERS. Have an aircraft rating for that plane?

Mr. BAKKE. That is correct, sir.

Senator SMATHERS. Is it a fact that many of the copilots do have, from time to time during the course of the flight, the responsibility of flying the plane, or flying a plane which they have not been checked out to fly?

Mr. BAKKE. For which they do not have an aircraft rating; yes, sir. There is a checkout or training requirement with respect to the aircraft type that is applicable to the copilot. But this does not require an aircraft rating.

Senator SMATHERS. You have indicated that you think it would be desirable, however, to make it possible that all copilots have an aircraft rating for the plane which they are going to fly on. Did you not say that a minute ago?

Mr. BAKKE. No, sir; I did not say that. Principally because to say that requires, in addition to the comment which I did make—namely, that it would be desirable and would have a desirable effect—it also requires an assessment of its economic cost.

It is whether that desirable effect can be justified in terms of its expenditure. So far as the Board is concerned, on the safety record, they have not seen fit to date to make such a recommendation.

Senator SMATHERS. What is the cost of getting an aircraft certificate for the plane which the copilot regularly flies?

Mr. BAKKE. I am sorry, Senator Smathers, I do not think I could give you a very precise answer to that.

Senator SMATHERS. Then how do you know that the cost is prohibitive?

Mr. BAKKE. Sir, what we have done is to examine the safety record to see whether there is anything in the safety record which would indicate an outstanding or significant deficiency in that respect. Failing to find such an indication, the Board has chosen not to make a recommendation.

This is the basis upon which the Board has decided not to recommend. It recommends because the safety record indicates the advisability of recommending.

My comment with respect to this weighing of economic factors is merely an explanation of why I did not say that it was desirable that this be accomplished. I am saying that before this decision is made, somebody will have to weigh the economic versus the safety contribution.

As of the moment, this somebody is the Federal Aviation Agency, whose responsibility it is.

Senator SMATHERS. Is it or is it not possible that you might find today, on the Boeing 707, the jet plane, flying between New York and Miami, a copilot who actually in fact has not been given an aircraft certificate to fly that plane himself?

Mr. BAKKE. Again, sir, with respect to aircraft rating, yes.

Senator SMATHERS. Do you think that if the general public were aware of this that it would give them a great feeling of comfort in flying one of those enormously fast planes, landing at enormously fast speeds?

Do you think they would be more comfortable in the knowledge—put it in the reverse: Do you not think they would be more comfortable in the knowledge that the copilot did qualify, did have that aircraft rating to fly the plane, the Boeing 707?

Would that not actually encourage business?

Mr. BAKKE. Sir, I do not have a good feel for this situation. I do not know whether the——

Senator SMATHERS. I do not have a good feeling about the present situation. That makes us even.

I do not understand how you can say that your answer is, if my understanding is correct, that it is mainly too expensive without being familiar with the cost?

Mr. BAKKE. No, sir, that was not my answer.

Senator MONRONEY. Pardon me, if I might interject—what you are saying is that aside from the elements of actual safety investigation, the duty to require proficiency in that machine rests primarily with the FAA. The issuance of a rulemaking order to the effect that the pilot be qualified, fully qualified as a copilot rests with the FAA.

Mr. BAKKE. Yes, sir.

Senator SMATHERS. My answer is that the FAA apparently has not seen fit to do that. But the CAB apparently has been authorized to direct the FAA to do it.

Does not the CAB have the right to recommend it to the FAA?

Mr. BAKKE. Yes, sir. We have the right to recommend, and the duty. The Board has chosen not to recommend because it has not identified from its past investigation any specific deficiency which appears to be outstanding in the safety record.

Mr. BOYD. To recommend, but not direct.

Senator SMATHERS. As I look at the accident reports that have been filed, it is very difficult for you people, when these accidents occur, to know actually what did happen in many of them. They are all matters of conjecture. Whether or not one plane or 25 lives could have been saved by having a copilot who was actually certificated to fly the plane and was as competent to fly the plane as the pilot, whether

or not that may or may not have saved that plane, we don't know and I don't know that you ever will know that.

You are in an area where it is difficult to specifically say it is because of the copilot's lack of experience.

My point is that I cannot help but believe as a matter of general safety that a copilot who flies certainly a Boeing 707 or a DC–8 should be certificated in every respect to fly that airplane in the event that something should happen to the pilot, I know that you now have them confined to the front end, but today's plane is traveling at rapid speed and carries up to 80 and 90 passengers—it would seem to me that it would be only desirable in the interest of general aviation safety to require that a copilot be certificated, as you say, to fly that particular plane.

Senator ENGLE. Would the gentleman yield?

Senator SMATHERS. Yes.

Senator ENGLE. I assume that there is a fully certificated crew on all those airplanes?

What they do is put on an extra pilot in order to give him time? Is that right?

Senator SMATHERS. I don't think that is a correct assumption. I do not think that the copilot is actually, as Mr. Bakke said—what do you call it—fully certificated to fly the particular plane.

Senator MONRONEY. Would this help clarify it——

Senator SMATHERS. Let me just ask the question.

Is that right or am I wrong on that?

Mr. BAKKE. Sir, the copilot is not required to have an aircraft-type rating.

Senator SMATHERS. That is right; to fly that particular aircraft.

Senator ENGLE. But he has an air transport pilot's license.

Mr. BAKKE. He has the appropriate certificate. The required certificate is a commercial pilot certificate with instrument rating.

Senator SMATHERS. Is it possible that he could have been on DC–3's or DC–4's and then be called in, for example, where the regular copilot was sick that day to fly the Boeing 707 on the run from New York to Miami.

Mr. BAKKE. If he has completed the requirements of part 40 of the civil air regulations for training in the 707.

Senator SMATHER. For training?

Mr. BAKKE. Yes, sir.

Senator SMATHERS. In other words, he could have his first run. He can be having his first training period in that 707 on that day?

Mr. BAKKE. No, sir. This is a practical matter of impossibility. There is a very comprehensive training program which is spelled out for the copilot as well as the pilot.

The only difference is that when the copilot finishes the training program prescribed for him, he does not receive an aircraft type rating. There are additional requirements imposed on the pilot in command.

As a result of completion of all of these qualifications and a demonstration to a representative of the Administrator he may be issued an aircraft type rating. But there are very comprehensive training requirements applicable to both. The copilot may not be used unless he completes these.

Senator SMATHERS. As a hypothetical question, would it not be safer to have two men flying that 707 who have the aircraft rating needed to actually be in command of the 707 whenever it takes off? Would it not generally improve the safety conditions?

Mr. BAKKE. I think the answer to that would be "Yes."

Senator MONRONEY. Could I ask one specific question?

Was the copilot on the jet plane that took the dive over Newfoundland fully qualified to take over command of that plane in that emergency and to go through all necessary maneuvers to bring it out of its violent performance?

Mr. BAKKE. Sir, I don't recall——

Senator MONRONEY. You investigated this?

Mr. BAKKE. Yes, sir; and issued a report, a copy of which is in your file. I can check in just about a minute and let you know whether he actually had an aircraft rating. I just don't recall whether he actually did have an aircraft rating. My impression is that both pilots did. But I would have to check that to be certain.

Senator MONRONEY. We will get into that this afternoon. I think it is urgent that, whether the copilot has the same technical rating as the pilot, that he is able, under all circumstances, to bring that plane through with the same ability as the pilot would have, less perhaps the experience of a greater number of air hours.

Mr. BAKKE. Sir, they both had aircraft ratings for that type.

Senator MONRONEY. For that type?

Mr. BAKKE. Yes, sir.

Mr. DURFEE. Mr. Chairman, while we have pointed out that our responsibility is confined to making recommendations, the regulations are the responsibility of the FAA.

I might say that this questioning is not entirely, particularly of Mr. Bakke—is not entirely extraneous since I think he will shortly assume the responsibility of being in charge of the Bureau of Flight Standards of the FAA.

I think that the public announcement has been made.

Senator SMATHERS. Do you want us to keep that information confidential?

Mr. DURFEE. A joint press release was issued by me and Mr. Quesada.

Senator MONRONEY. Senator Cotton has some questions.

Senator COTTON. Mr. Durfee, would it be possible, very briefly, to indicate the categories of probable cause that the CAB divides its findings in accident investigations?

They do fall into categories of probable causes, do they not?

Mr. DURFEE. Yes, sir. I think we have that information tabulated here. It is in this blue book to which I referred.

Senator COTTON. Just as a preface to a couple of questions could you, at least in a skeleton way, get it in now?

Mr. DURFEE. Under "Q", volume I, we have accident types and operational phases of fatal air carrier accidents, which is broken down into a number of classifications.

Senator COTTON. In other words, you have hard landing, overshooting, collision, stall, fire in flight, engine tear-away, and so forth?

Mr. DURFEE. Yes, sir.

Senator COTTON. Could you say whether the major portion of accidents are believed to have been caused by pilot error or equipment failure? Which of the two would be the more frequent cause?

Mr. DURFEE. In air carrier operations or general aviation?

Senator COTTON. I am referring first to air carrier operations.

Mr. BAKKE. Sir, we can get you the precise values on a study which we recently accomplished on I believe a 3-year period.

I might say first, however, in answering your question, that because the pilot is the most important single element in the operation of any aircraft, that the defect or deficiency or error on the part of the pilot is bound to have the most serious effect on the safety of that operation.

I believe, sir, so long as we need pilots flying up front, he will be the most critical single element of any aircraft operation. This is reflected in the record.

So far as air carrier operation is concerned, the incident of pilot error accident as contrasted with other factors, is small when compared, for instance, to general aviation accidents.

But it nevertheless is the largest single factor. I believe we can identify it in somewhat more specific terms.

In terms of percentages, for instance, for the year 1958, which is the last full year on which we have had complete statistics, the type of factor which could be identified as a personnel error factor, was involved in 52 percent of all of the causal factors which were identified in all air carrier accidents during that year.

Senator COTTON. By "all accidents" you mean nonfatal as well as fatal?

Mr. BAKKE. Yes, sir. All accidents.

Senator COTTON. And that refers to both carrier and general?

Mr. BAKKE. No, sir. This is air carrier. Scheduled, other than scheduled, domestic and international. Of this 52 percent, 28 percent have been identified as errors on the part of the pilot or pilots, 4 percent on maintenance inspection; 8 percent on airport personnel, and 12 on a miscellaneous of other persons. Of factors which are other than personnel factors, a total of 48 percent.

These involve such things as powerplant, airframe, landing gear, equipment and accessories, weather, which was not capable of being forecast and for which ordinary provision could not ordinarily cope, terrain, and miscellaneous, 48 percent.

Senator COTTON. So that generally speaking, in the case of carrier accidents, slightly more than half you believe are attributable to personnel error?

Mr. BAKKE. Yes, sir.

Senator COTTON. Still referring to carriers, have you the conclusions as regards fatal accidents only?

Mr. BAKKE. I am not certain—I know that we do not have them before us.

Senator COTTON. Before you go into another volume, let me withdraw that question and ask you, out of these categories in the case of general aviation——

Mr. BAKKE. In the case of general aviation there is a much larger number of accidents which are attributable to pilot error. Of a total of 2,082 causal factors which were identified in this one study, ap-

proximately 65 percent were attributable to personnel error, pilot personnel and other personnel.

Senator COTTON. Is that both fatal and nonfatal?

Mr. BAKKE. This is all, yes. These are all. Causal factors involved in all accidents subject to study.

I might say that this by the way covers accidents which have been analyzed to date in 1959.

Senator MONRONEY. May I interpose a question here?

Senator COTTON. Certainly.

Senator MONRONEY. Would a pilot flying into weather in which he was not equipped to fly—in other words, a noninstrumented plane and a pilot without an instrument list—would that be called pilot error or would that be called weather?

Mr. BAKKE. Sir, it would depend on the circumstance of the particular accident. In a very large number of cases two causal factors would be identified. I might say with respect to these statistics that 2,082 causal factors do not add up to 2,082 accidents. There may be several causal factors identified with each particular accident. If in the investigation we find that the sources of information and the other indications available to the pilot were such that a reasonable, prudent pilot should have been able to determine the significance of his act, we would then identify it in the investigation as a pilot error.

If we conclude that the weather situation was one over which the pilot could have exerised no action to avoid its consequences, we would not have shown pilot error. It would depend on the circumstances.

Senator MONRONEY. You mean nonforeseeable?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. If you think he should have foreseen the weather condition, then it is a pilot error. If he ordinarily would not be expected to foresee it then you have not put it as pilot error?

Mr. BAKKE. Exactly correct.

Senator MONRONEY. You anticipated my next question when you stated that more than one cause may be attributed to the same accident.

When this falls into 52 percent and 48 percent with the carriers, such percentages are more or less an arbitrary figure, are they not? There is certainly a dual zone in there somewhere.

Mr. BAKKE. By all means. We begin with definition of accident categories, which if changed could result in the moving of accidents into one or another category, yes. This classification is one which, if our basic definitions were altered, could be affected numerically.

I might say its principal significance so far as we are concerned, is that the comparison of the year 1958 with the six preceding years, demonstrated exactly the same relationship on the basis of the same system of evaluating accidents. We came out with a 6-year period, 1952 to 1957, with exactly the same percentages, 52 to 48 percent.

Senator MONRONEY. In other words, your general conclusion is that in the case of carriers the human error, the personnel error is slightly more than half, and in general aviation substantially more than half?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Without taking the time now, would you be willing to insert in the record, if you have it, those figures confined to fatal accidents only?

Mr. BAKKE. Yes, sir; we could do that.

Senator MONRONEY. This returns to Mr. Durfee.

Mr. Durfee, does the Civil Aeronautics Board employ a prescribed form for the regular transmittal of recommendations and the results of accident investigations to the FAA?

Mr. DURFEE. We first supply the Federal Aviation Agency with a report of the accident and the findings and cause. The recommendations are transmitted. I do not believe we have any special type of form. It is a communication to the agency.

Senator MONRONEY. I am referring only to the report, a report of specific accident investigations from the CAB to the FAA.

Is there a regular form employed for those reports, a fixed uniform procedure?

Senator COTTON. Of the investigation of the accident?

Mr. DURFEE. Yes, there is a regular form. There is a copy of it included in book No. 4. You will find it indexed at F and A.

Senator COTTON. In addition to the report of your investigation of accidents, you from time to time make specific recommendations for regulations arising out of these investigations; is that correct?

Mr. DURFEE. Yes, sir.

Senator COTTON. Could you give the committee examples of specific recommendations that have been made by the CAB during the past year to the FAA suggesting regulations?

Mr. BAKKE. Sir, I might state that again in book 4, in sections A and B, there are approximately 40 examples of recommendations which have been transmitted to the Administrator during the past year concerning conditions that have been uncovered as a result of accident investigation.

Senator COTTON. Of those 40 examples, do they recommend that specific regulations be promulgated?

Mr. BAKKE. Yes, sir; they may.

Senator COTTON. All I am interested in now is at least a few instances of specific recommendations which the CAB is suggesting or recommending the FAA adopt.

Mr. BAKKE. I wonder if I could suggest——

Mr. DURFEE. Book No. 1, subtitle F, contains recommendations. The first are recommendations submitted by the Engineering Division, but there are recommendations submitted by the other divisions of the Bureau of Safety.

Perhaps Mr. Bakke can give you some illustrations.

Mr. BAKKE. I might illustrate a few of them, sir. Early this year Riddle Airlines lost a cargo C–46 near Alma, Ga., as a result of fire in flight. The contents of the baggage compartment having been ignited by reason of an unguarded electric light bulb in the baggage compartment which ignited the contents and caused an in-flight fire and resulted in the destruction of the aircraft with fatal injuries to the pilot and copilot.

The Board submitted a recommendation to the Administrator urging that an "AD" be published, or that appropriate action be taken within the FAA to cause a modification of all C–46 aircraft to insure that that light was out when the baggage compartment was closed, that it was properly guarded so as to prevent a recurrence of this fire. That action was taken.

As another example, the chairman referred to a report which was recently issued by the Board concerning the Electra accident at New York, as a result of which several recommendations were transmitted to the FAA.

One of them, for instance, was the recommendation we had discussed earlier with respect to the flight recorder program. Another one was with respect to the use of aircraft simulators in air carrier training programs.

Throughout this section (f) there are many, many such illustrations of recommendations transmitted.

Senator COTTON. Mr. Chairman, would it be possible to have at this point in the record, briefly, the specific recommendations that the Civil Aeronautics Board has made to the Federal Aviation Agency for regulations, for new regulations or amended old regulations in the period of one year past?

Senator MONRONEY. Would the Senator yield?

Senator COTTON. Certainly.

Senator MONRONEY. Since this comprises about 40 recommendations, would the Senator agree to resume this as we open the afternoon's session?

Senator COTTON. I will be very glad to.

Senator MONRONEY. We will be less hurried.

Senator COTTON. It appears to me from glancing at these 40 recommendations, that they are 40 cases. However, they do not appear to be 40 specific recommendations. They are 40 reports. I glanced hurriedly at them. What I am seeking is not the number of reports of accident investigations, but rather the number of specific recommendations for the promulgation of regulations resulting from those results in the past year.

Mr. DURFEE. Do I understand that you want a list of cases in which the Board has said we recommend that a regulation providing as follows be promulgated, or that an existing regulation be revised as follows?

Senator COTTON. Exactly.

Mr. DURFEE. We can furnish you with a list of them.

Senator COTTON. Thank you. May I resume this afternoon?

Senator MONRONEY. Yes. You can resume when we return. I hope Mr. Bakke will be prepared after that to give us a chronological briefing on the fatal accidents, with some testimony on the nonfatal which appear important in the air picture. We will not need General Quesada this afternoon.

We will not be able to reach him. We expect to consume the afternoon with the air safety men of the CAB.

Senator SMATHERS. Let me ask one question before you recess.

Senator MONRONEY. Certainly.

Senator SMATHERS. Mr. Chairman, based on the yardstick which you customarily use in accident cases, what is your forecast—do you have a forecast—as to how many fatalities there will be in aircraft in 1960? Do you have anything of that character?

Mr. DURFEE. Maybe Lloyds of London or some insurance actuaries who make a business of predicting could.

Senator MONRONEY. The National Council puts out a figure for the 4th of July, New Year's, and Christmas. I wonder if you people have such forecasting agency, and if so what are the prospects.

Mr. DURFEE. I don't think we have any forecasts. I think about the only place I can think of finding it would be in the insurance companies insuring these aircraft, for both structural damage and personal liability. They must have some idea.

Senator MONRONEY. But you don't have any?

Mr. DURFEE. No, sir.

Mr. Chairman, may I conclude this part of our presentation by saying that we certainly appreciate this opportunity, and particularly in view of what I am sure is a very busy session of Congress, for the unusual attention which this committee is giving to this particular subject, because we, as you have expressed in your communication to us, do share the opinion that this is a vitally important matter.

If I understand it, Mr. Chairman, in the agenda which you have established, the next item in which you have specifically asked that we——

Senator MONRONEY. If there is anything in air safety which would be emphasized on traffic control or airspace matters, we would like someone on hand to take up whatever matters might be appropriate from the Board.

Mr. DURFEE. That will be done.

Senator MONRONEY. It could be that your safety representative will not require the undue attendance at these sessions when there is nothing of vital interest that the Board is expecting testimony on.

Mr. DURFEE. This will be done.

Senator MONRONEY. Thank you very much for your testimony and for your answers to our questions. The committee will stand in recess until 2:30 this afternoon.

(Thereupon, at 12:29 p.m., the subcommittee was recessed, to reconvene at 2:30 p.m., the same day.)

AFTERNOON SESSION

Senator MONRONEY. The Subcommittee on Aviation will resume its sitting.

By request, the Chairman, who has matters pending before the CAB, has been excused from the afternoon session. Mr. Bakke, the Chief of the Safety Branch, will give us further detail on the accident record.

I believe Senator Cotton has a question which was to be addressed to Mr. Durfee, but perhaps Mr. Bakke or representatives of the CAB might tbe able to answer to his satisfaction. If not, we will ask Mr. Durfee to come back either late this evening or tomorrow morning to testify on that point.

Senator COTTON. I am sure that won't be necessary, Mr. Chairman. I had almost finished my questions when we recessed. I do have one left.

However, I had already requested to place into the record the specific recommendations of the CAB to the FAA; which appear under "F" in book 1 of the exhibits here.

I have been over these recommendations and I find that they are all in here, and very clearly set forth. I apologize for asking that they be put in the record, and I withdraw that request.

Senator MONRONEY. Would the Senator like to have them placed in the record? I think it would be responsive to his line of questioning. Since they are not unduly long it might be well to have those follow the questioning of this morning. (See app. I.)

Senator COTTON. All right. I indicated this morning I thought they were not completely here, but they are very complete. Of course you can't expect to give us several books and have us know everything in them the first day.

They are in brief form. Perhaps they should go in.

Senator MONRONEY. Yes, I think they should go in. They will provide a more responsive answer to your questions.

Senator COTTON. The only other question I had in mind to ask Chairman Durfee, which you may or may not care to express an opinion on, involves the penalty, up to a thousand dollars, which FAA can access for violations of regulations. It seems to me that while this is an adequate penalty for an individual such as a pilot, it does not seem to be a great penalty against a large carrier, an airline. Would you care to express an opinion as to whether in that latter case it is an adequate penalty?

Mr. BAKKE. Sir, I have no view in this respect; as to its adequacies or inadequacies.

Senator COTTON. With no desire to cast any reflection on any airline, or even give any impression that any such practice has taken place, it is perfectly conceivable that an airline could make money by sending a defective, a slightly defective or questionable piece of equipment on a flight, paying a thousand dollars on a flight that might net them five times that. Of course I am sure that the vast majority of airline people would not countenance such actions—they would not compromise the integrity of the airline and the safety of the public.

Mr. BAKKE. I might make one observation, sir, that perhaps isn't directly responsive; and that is that in instances such as this, of course the alternative always is available, to move against the air carrier operations certificate. This is another authority that the Administrator possesses which may be appropriate in the particular case.

Senator COTTON. So that the penalty, the so-called fine, as regards airlines, hasn't much significance one way or the other; would that be your general conclusion?

Mr. BAKKE. As I indicated before, I have no real feel for its adequacies or inadequacies. The only point I make is that should it be determined to be inadequate, there is an alternative process available; namely, to move against the operations certificate.

Senator MONRONEY. Could I interject? The provision providing for a fine was included in the legislation to supplement the provision covering revocation of the carrier's license or the grounding of the airline for certain days, or things of that kind, in order to get better performance for an overloaded flight or for minor infractions of the air regulations that did not seem of sufficient gravity to require the more serious type of punishment. There was a fine of $10,000 recom-

mended by the Administration when we had this up. But we felt that many times the succeeding violations—in other words a plane that is overloaded, making several takeoffs on its flight, would be subject to an individual fine of $1,000 for each takeoff and landing it made while overweight. So these would tend to compound the penalty to a greater degree than just the $1,000 single fine.

Senator COTTON. I thank the chairman for his observation. I have nothing further.

Senator MONRONEY. We want to start in with Mr. Bakke, head of the Aviation Safety Section of the CAB, on those airline crashes in 1959 for which you have completed a study and in which you report the findings of the Civil Aeronautics Board. I believe it would help if we would take them chronologically, and then have whatever testimony you could give at this time on the known causal factors of accidents which you have checked out thoroughly and those accidents in which the investigation has not yet been fully completed. We recognize that there may be many facts of these accidents which are still undergoing careful investigation and study, and for that reason it would be unwise at this time to speculate with evidence that is not properly developed by careful checking. The committee, however, will be concerned at some later time, perhaps privately, in being advised what the lines of investigation are, and what lines they are proceeding along. Since they are unverified, an executive rather than public hearing would probably be in order. With that understanding I think it would be quite proper for you to proceed with the detailing first of those investigations which have been completed.

Mr. BAKKE. The first and major accident that occurred in 1959, and on which the Board's investigation was completed, involved Southeast Airlines at Bristol, Tenn., on January 8.

Senator MONRONEY. We are taking up, are we not, the fatal accidents that have occurred?

Mr. BAKKE. Well, sir, not all of these accidents are fatal. These are accidents which the Board has regarded as major accidents; accidents which have so serious an impact on the industry or on the public interest as to require a public report.

Senator MONRONEY. That will be fine. We will detail those. I just wanted to be sure which categories we were on. That will include all of those which you consider major in their application to air safety.

Mr. BAKKE. Yes, sir. The complete reports of each of those accidents is found in book 3 of the documents that we have placed before the committee.

On January 8, 1959, a Southeast Airlines DC–3 struck a mountainside near Bristol, Tenn., while on an ILS approach to the Tricity Airport. The aircraft was demolished and all of the occupants, including seven passengers and three crew members, were fatally injured.

In this accident the Board determined that its cause was the erroneous identification of a radio navigation fix in the vicinity of Bristol, and the decision of the pilot, nevertheless, contrary to company and regulatory procedures, to continue an ILS approach without positive identification of his position, causing him to make a descent below the level of terrain and collide with a mountain.

The next accident involved Eastern Airlines at Miami, Fla., on January 17 of this year. This accident involved——

Senator MONRONEY. How is that identified in book 3? Is that identified under "O"——

Mr. BAKKE. That is identified under section O, book 3.

This accident involved a 1049–G, operated by Eastern Airlines, in which the failure of the No. 3 engine, which initially was the failure of a connecting rod which resulted in the complete destruction of the power section of the engine, and in the subsequent discharge through the oil breather of large quantities of oil which the Board determined were ignited by the exhaust flame, starting a fire which could not be brought under control. The aircraft returned to the same airport, landing on a parallel runway in the opposite direction, and came to a stop. All occupants of the aircraft were disembarked without serious injury, but the aircraft continued to burn and was totally destroyed.

The particular significance of this accident was the adequacies of firefighting facilities on the airport to cope with a fire of that magnitude. The Board concluded that the facilities were not adequate for this purpose and recommended that the Administrator initiate a study to determine what standards should be applied for the improvement of firefighting facilities at airports served by our certificated carriers; and this study is underway.

Senator MONRONEY. This was the released September 20, 1959, report?

Mr. BAKKE. That is correct.

Senator MONRONEY. You mentioned the firefighting equipment being inadequate at the airport. But in your brief you also state that you have recommended to the Federal Aviation Agency that consideration be given to a requirement that zone 3–A be serviced by fire detection extinguishing equipment. Has that been done and that modification required on that type of aircraft?

Mr. BAKKE. I have no knowledge of what final action was taken with respect to this recommendation. I have no knowledge that we have heard directly from the FAA as yet.

The next accident involves General Airways at Kerrville, Texas, February 1, 1959. In this operation, one known as a CAM, or civil air movement, General Airways carried military personnel under contract to the U.S. Government. Of the 28 occupants, including 3 crew, there was 1 passenger and 2 crew members killed. The Board determined in this case that the accident was caused by the deficient, the poor judgment of the pilot in continuing the flight into known serious icing conditions. Throughout the report the Board also makes clear the fact that the disregard by the crew of the flight time limitations of the civil air regulations, as well as other provisions of the civil air regulations, contributed substantially to the cause of the accident.

There is little question in the Board's mind that this crew was operating in a fatigued state and was unduly pressing completion of their flight under dangerous icing conditions.

Senator MONRONEY. You say they were operating under a fatiguing state. They had been on continuous duty for more than 40 hours?

Mr. BAKKE. More than 40 hours, of which 32—that is, 32 of those 40 consecutive hours—were in flight.

Senator MONRONEY. Do you mean there had been no rest period whatever for the crew?

Mr. BAKKE. No, sir.

Senator MONRONEY. For that 40 hours?

Mr. BAKKE. No, sir, there had not.

Senator MONRONEY. Is there civil inspection over this CAM operation, or is this left to the discretion of the military to select and to farm out to these companies this traffic on a low-bid basis?

Mr. BAKKE. I would have to say "No" and "Yes." There is civil supervision. These operations are conducted under part 42 of the civil air regulations. I would presume while this is not a matter which is within the jurisdiction of the Board, that the same machinery is available for enforcement of part 42 as is available for enforcement of other regulations.

With respect to the manner in which this particular operation was conducted, it was conducted on the basis of a bid by this air carrier, a successful bid which led to the award of this contract.

Senator MONRONEY. I thought there was a civil regulation that prohibited a pilot from flying more than 8 hours at a stretch?

Mr. BAKKE. The provisions of part 42, which include among others that requirement, are applicable to this operation; yes, sir.

Senator MONRONEY. In other words, they were four times over the limit and they were still departing from a leg of the flight into dangerous weather is that correct?

Mr. BAKKE. Yes, sir; that is correct.

Senator MONRONEY. You have no way of knowing, I imagine, whether there was any action taken against the particular company involved?

Mr. BAKKE. Sir, General Airways is in bankruptcy and is no longer operating as an air carrier.

Senator MONRONEY. The CAB does have power, does it not, since these are certificated carriers, even though nonscheduled, to revoke licenses if you find the offenses merit such action?

Mr. NEWMAN. What kind of a license were you referring to, Senator?

Senator MONRONEY. Supplemental carrier.

Mr. NEWMAN. We have power to do what?

Senator MONRONEY. To revoke the license. For instance, if they are using pilots 32 hours at a stretch to carry servicemen or passengers, the Board on its own motion would have the power to revoke the air carrier license, would it not?

Mr. NEWMAN. If we found that the carrier was not fit, willing, or able, or was unwilling or unable, to comply with the rules and regulations, we would have the authority to revoke it.

Senator MONRONEY. Would not the use of the same 32 hours at a stretch on a regular scheduled airline result in some action in a hurry from the CAB?

Mr. NEWMAN. I am not so sure that the violation, if it were a safety violation, would have resulted in revocation. It might be an action that would be taken by the Administrator because of a violation of the civil air regulations. The Board would revoke for other reasons.

Senator MONRONEY. Their certificate indicates they are to be ready, willing, and able to carry out the functions of an air carrier. But if they are flying four times the maximum of hours that the regulations

permit, certainly, de novo, the Board would have the right to move in, would it not?

Mr. NEWMAN. I do not recall the Board ever having taken action in this area, Senator, but certainly the FAA would have ample authority to take corrective action, and it may very well be that that would be a ground for revocation so far as the Board is concerned.

Senator MONRONEY. Do you know today whether any such hours are being observed; i.e., crew members required to fly in excess of their legal limits, by the nonscheduled airlines, supplemental carriers?

Mr. BAKKE. Is that question whether the Board has ever taken cognizance?

Senator MONRONEY. Yes. In other words, who runs the check, who finds out whether these very basic and fundamental regulations are violated? Is that the duty of the CAB, of the FAA, or a joint responsibility?

Mr. BAKKE. It is clearly the duty of the FAA. The Board would enter into this kind of picture only where an accident or a special investigation under title VII were required, such as in this case. In this kind of a case, an accident having occurred, we would of course make such an investigation.

Normally, however, this would be the responsibility of the FAA.

Senator MONRONEY. You said the casualties were two crew members and how many servicemen?

Mr. BAKKE. One.

Senator MONRONEY. But this could have very easily but for good luck or circumstances resulted in complete annihiliation of the entire group?

Mr. BAKKE. It could very well, sir.

Senator MONRONEY. Your finding was that they knowingly flew into icing conditions with a heavily loaded plane?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Is there any authority that exists, so far as you know, for closing the airport for departures to certain areas where heavy icing conditions or other dangerous weather conditions exist?

Mr. BAKKE. I know of no such authority.

Senator MONRONEY. It still rests upon the determination of the pilot, is that correct—excepting the companies which have large, properly trained and properly equipped weather informational service? Those are used I presume in guiding the pilot to make his decision to go or not to go.

Mr. BAKKE. As a practical matter I think it would be safe to say that it is the determination of the pilot.

Senator MONRONEY. It would not be true on some of the major airlines, would it?

Mr. BAKKE. The reason I say as a practical matter, I think it does lie within the authority of the Administrator, for instance, to ground an aircraft, to ground an airman, or to take other emergency measures under particular circumstances. But this would require the Administrator, his agent, to be on the spot at the particular time, a highly unlikely situation.

As a practical matter I would state again it would depend entirely upon the pilot's judgment in the matter.

Senator MONRONEY. In other words, if you were flying out of Washington National, bound for New York, and you had severe icing conditions between here and New York that were known by the meteorologist at the airport to be impossible or impassable with safety, would the control tower still be required to give the clearance from the field for the planes take off?

Mr. BAKKE. It is my view that it would, sir.

Senator MONRONEY. That is both public transportation and private?

Mr. BAKKE. It is my view in both cases; yes, sir.

Senator MONRONEY. Has there been any consideration given to requiring clearance from the airport control tower operators for destinations which, in public transportation particularly, would indicate a grave danger exists?

Mr. BAKKE. Never, sir, so far as any matters which have arisen out of accident investigation.

In other words, the Board has never found anything from its safety investigation activity that warranted a recommendation to this effect. Whether anyone within the FAA might have such a proposal under consideration I don't know. I would, however, like to call to your attention that in scheduled air carrier services, operating under parts 40 and 41, there is provision made for a dispatcher who does have the authority to prevent the initial dispatch of a flight into known hazardous conditions.

Senator MONRONEY. And he is advised by the meteorological department of that scheduled airline of the weather conditions, and then he can cancel the flight?

Mr. BAKKE. That is correct.

Senator MONRONEY. But there is a second check in that case. Even though the dispatcher is willing to dispatch the flight, the pilot can still decline?

Mr. BAKKE. Either may cancel the flight prior to its origination.

Senator MONRONEY. So generally speaking you would say that with the normal operations of scheduled airlines there is a very definite secondary check on dispatching into extremely bad and dangerous weather a passenger-carrying certificated airplane?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. In the other, have there been any other cases such as this example of not only going off in known icing conditions but with a crew that is fatigued, in your current accident record?

Mr. BAKKE. No, sir. I would like to in this respect call the attention of the committee to the fact that we have presented certain statistics concerning the operation of air carriers other than scheduled air carriers, including CAM operators, and have indicated that their record during the recent past several years has been excellent.

As a matter of fact, I think in one place we pointed out that we have to go back 5 years before we find more than this one passenger fatality.

As we go back beyond that, particularly into the late forties, we come up with many instances to indicate the situation which you just described.

Senator MONRONEY. In other words, you feel that the responsibility now of these carriers to fly according to safety regulations is much better than it previously had been.

Mr. BAKKE. Let's say the safety record reflects this.

Senator MONRONEY. You may proceed.

Mr. BAKKE. I wonder if I might make one correction for the record. Concerning your question on the zone 3 protection for the 1049–G, I am reminded that there was an initial response to our recommendation in which the FAA indicated that this matter was being sent to their Los Angeles office for further study. Since that reply we have had no indication of its disposition.

Senator MONRONEY. Thank you.

Mr. BAKKE. On February 3, 1959, Pan-American World Airways experienced an unusual maneuver in a Boeing 707 in which, while the captain was away from the cockpit, the copilot was preoccupied with duties other than the physical manipulation of the controls. The automatic pilot became disengaged and the aircraft gradually went into a steep turn, the nose dropping below the horizon, and a very high-speed spiral dive resulted.

The Board found that this accident was the result of the inattention to the flight instruments by the copilot who was left in charge in the cockpit in the absence of the captain.

I might say that there was substantial structural damage to the aircraft which resulted, but fortunately, despite some rather unusually high stresses upon the aircraft structure, it remained flyable and a safe landing was made at Gander, Newfoundland. None of the 119 passengers and 10 crew members sustained any serious injury as a result.

Senator MONRONEY. This recovery was made possible, however, was it not, by the fact that the captain, although he had left the cockpit and had been absent for some time, observed that the plane was in a steep descent and literally fought his way into the cockpit, pulling himself forward in some manner to take over the controls which the copilot apparently was unable to master.

Isn't that correct?

Mr. BAKKE. Yes, sir. I think it should be pointed out that as a part of our investigation of this accident, it was also necessary to give very close study to a system on the airplane known as the mach trim system. The mach trim system was not functioning.

Senator MONRONEY. Explain what the mach trim system is.

Mr. BAKKE. It is the function of the mach trim system, in effect, to straighten out the control pressure curve for the airplane with variation of speed. In jet aircraft, in aircraft having the speed capability of the 707, as the speed increases for a given trim setting it is necessary gradually to increase the forward pressure on the yoke. This is typical of all aircraft.

Senator MONRONEY. The forward pressure on what?

Mr. BAKKE. On the yoke, on the control wheel. Most of the pilots of conventional aircraft, of reciprocating engine aircraft, have experienced precisely this effect before.

As airspeed increases for a given trim setting it is necessary to push forward on the control wheel to keep the nose on the horizon. The reason for this is as the speed increases, the lift on the wing increases and the tendency is for the nose to come up. Were a reciprocating aircraft to dive out of control, the increasing speed would have the tendency by reason of the increasing lift on the wing to pull the nose up into a recovery.

In other words, a conventional aircraft would tend to recover, of itself, if trimmed neutrally, for the power condition which exists.

What is unique with these high speed aircraft is that eventually the airplane reaches a point on the speed curve at which the tendency reverses itself.

There is reached a point at which, with increased speed, the aircraft has a tendency to nose under. This tendency increases——

Senator MONRONEY. That steepens the dive?

Mr. BAKKE. Which steepens the dive. The point on the speed curve at which this occurs with the 707 is not far removed from the normal cruising speed. When this dive occurred, Captain Peters made an effort to recover by pulling the nose of the aircraft up.

Senator COTTON. Was that the copilot?

Mr. BAKKE. The copilot. By pulling the nose of the aircraft up as he would normally have expected to do in other aircraft types flown by him. It was not immediately apparent to him, however, as the airspeed increased, that there became an increasing requirement for more and more pressure on the control system. He did put in a little bit of trim, but he never quite caught up with the airplane, so to speak. He never gave it enough control pressure or enough trim to overcome the aerodynamic effect which caused the nose to continue to go down.

With this occurring, the aircraft's dive continued to steepen and the speed continued to increase, until, through the efforts of both pilots as well as the flight engineer, eventually enough trim was put into the system, the aircraft was rolled out straight and level, and a recovery accomplished at 6,000 feet.

Senator MONRONEY. Was that recovery accomplished by the normal elevators, or by the ailerons, or flaps, or what?

Mr. BAKKE. It was recovered, sir, both by aileron and elevator. By elevator of course we would have to say the trim system. The trim system in the 707 of course adjusts the entire stabilizer. Trim was put in sufficient to permit recovery.

The airplane wings were leveled eventually by the use of aileron, and the pilots themselves were on the controls physically to pull the aircraft out of the dive. It was a combined maneuver as I have described it.

Senator MONRONEY. Did these contain the recorders?

Mr. BAKKE. Well, sir, we have had a rather unfortunate experience in this as well as several other accidents involving our recorders. This airplane did have a flight recorder installed. Unfortunately, the tape which was in the recorder had run its limit some 30 flight hours prior to this incident, so that the foil was stopped at the time.

Senator MONRONEY. In other words, the recorder was worthless for these purposes?

Mr. BAKKE. It was not entirely worthless. We were able to get some extreme values. But I might say that its total contribution to our investigation in this instance was very small indeed.

Senator MONRONEY. Did it show the speed of the plane when it went into the dive?

Mr. BAKKE. I don't remember the extent to which—if I remember correctly, sir, there were two parameters which were useful to us since they represented an extreme condition. Speed was one of

them, and I believe "G" was the other. However, since the foil was fixed, and the scribers were indicating their respective values in the same line—in other words, inscribing a mark on the foil over and over on the same line—we could not pick out the particular speed or "G" value in terms of time. We had to make some estimate in that because it was sufficiently above a normal "G" value or a normal speed indication, that it must have been associated with this particular incident.

Senator MONRONEY. This was a 29,000-foot dive?

Mr. BAKKE. It started at 35,000 and the recovery was made at approximately 6,000 feet; yes, sir.

Senator MONRONEY. You did find an extreme speed and "G" mark on the recorder?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Would you mind telling the committee what that speed was and the "G" curve?

Mr. BAKKE. Would the committee excuse us for a moment while we see if our flight recorder expert is with us?

Senator MONRONEY. Certainly.

Mr. BAKKE. Mr. Chairman, I am told that the maximum indication on the flight record was .95 mach. In other words, almost the speed of sound. And 6.6 G.

Senator MONRONEY. Does that comport with the levels for which the plane is certified?

Mr. BAKKE. It exceeds them, sir.

Senator MONRONEY. Both figures exceed it?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. It was very fortunate indeed that the plane had extra stresses which it wasn't required to meet; is that correct?

Mr. BAKKE. It speaks well for the structure of the aircraft; yes, sir.

Senator MONRONEY. What about the copilot—I think you said earlier in the day that he was checked out to handle that type of aircraft?

Mr. BAKKE. Yes, sir. Captain Peters had an airline transport rating. He was chief pilot of one of the divisions of Pan American, and he had an aircraft rating on the 707 with a total of more than 250 hours, as I recall—269 hours—in Boeing 707 aircraft.

Senator MONRONEY. How do you account for his lack of knowledge of setting the mach trim?

Mr. BAKKE. I might take this opportunity just to make a comment or two about the length of time that it has taken for the development of the release of this report. It had been indicated, at least the Board's attention had been drawn to the fact that some folks thought the Board took too much time in accomplishing this investigation, the thought being that we could have come to the conclusion that the copilot did not completely fulfill his responsibility in a much shorter time.

This is of course true. But the investigation to be complete had to include certain other aspects of the investigation, and in particular it dealt with such things as the reason for the failure of the autopilot. The reason that the autopilot disengage light on the cockpit did not

come on; the reason that the mach trim system was not functioning.

Senator MONRONEY. Both of those are supposed to be automatic?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. The light comes on if the autopilot is disengaged?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. And the mach trim is supposed to engage itself automatically when it reaches a certain speed; is that correct?

Mr. BAKKE. Sir, there is a switch in the cockpit which actuates the system. Provision is made on the checklist for turning the mach trim switch on after takeoff.

Senator MONRONEY. After you reach your climbout altitude?

Mr. BAKKE. Yes, sir; after you reach a certain altitude and configuration prescribed in the checklist. There was considerable investigation on the subject of whether the actuation of the mach trim system might have been overlooked by the crew, or, in the alternative, whether there actually was a failure of the mach trim system.

The Board, as completely as it was able, went through the system with a fine tooth comb but could find no reason for believing that the system malfunctioned, and at least expressed the view that one possibility was that the crew had neglected to actuate the trim switch.

Senator MONRONEY. Is that a duty of the engineer or copilot and pilot?

Mr. BAKKE. I don't recall whether it is the duty of the engineer specifically. The reading of the checklist and the confirmation of the completion of the checklist is, of course, the responsibility of the pilot in command.

Senator MONRONEY. The pilot usually reads the checklist and then his response comes from the copilot or engineer?

Mr. BAKKE. I don't recall which of the crew members is physically required to actually actuate the switch.

Senator MONRONEY. Was there any previous showing of the failure of the autopilot on a previous trip?

Mr. BAKKE. Yes, sir. As a matter of fact, on this very trip, as is indicated in the report.

Senator MONRONEY. Where will I find that? This material was not submitted to us until 10 o'clock this morning. Therefore, there could be many questions we would like answered. I wish that anything that you consider material or apt to be material, that you are certain of, is not omitted, because to me this is rather significant in the maintenance features of these high-performance aircraft.

Certainly if there has been neglect to properly advise the maintenance sections of something as important as the autopilot slipping out of gear—would that be reason for holding the plane if the pilot knew that that had not been repaired?

Mr. BAKKE. Not so far as the regulations are concerned.

Senator COTTON. Excuse me, what do you mean by that answer, Not so far as the regulations are concerned?

Mr. BAKKE. A particular air carrier may voluntarily establish a practice or a standard, an agreement with its crews, in which they would agree to hold a flight until particular instruments or facilities were available. But there is no regulation which would compel the holding of a flight because an autopilot was not functioning.

Senator MONRONEY. There are certain airlines I believe who still do not use autopilots?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. This is a matter of relieving tension on the pilot. Certainly if the pilot knows that the autopilot is there, and is apparently functioning, then it seems to me that it would be incumbent at least to put the pilot on notice that gadget is not working.

Mr. BAKKE. That is right.

Senator MONRONEY. It could be, as this evidently points out, dangerous in the extreme to start a pilot out without knowledge that his autopilot is liable to be out of gear.

Mr. BAKKE. This subject, Mr. Chairman, is covered on page 4, at the bottom paragraph of this report.

Senator MONRONEY. I believe for the information of those who are following the hearings, it might be wise to read that part.

Mr. BAKKE. All right, sir.

On several previous flights with Boeing 707 aircraft there have been disengagements of the autopilot without the existence of a mechanical failure, and after which the system functioned normally when the autopilot was reengaged. One such disengagement occurred on the immediately preceding flight of the subject aircraft. On this occasion the warning light failed to come on and the crew became aware of the disengagement by observing a 20-degree right wing low on the horizon indicator. Before recovery was effected, approximately 600 feet in altitude was lost. The warning light was connected by the crew immediately after the occurrence, and it did not light.

Senator MONRONEY. Was there any action taken against the company in this matter?

Mr. BAKKE. Yes, sir; there was action taken so far as the flight recorder maintenance was concerned.

Senator MONRONEY. The what?

Mr. BAKKE. The flight recorder maintenance was concerned.

Senator MONRONEY. But was there action taken on the failure to warn the crew that the autopilot was unreliable in this condition?

Mr. BAKKE. I am not aware of this. I suggest that this question be directed to the FAA.

Senator MONRONEY. So far as you know the action was taken for the failure to have the recorder in proper condition?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. And not in the sending of the plane on its transatlantic trip without an autopilot that apparently was not functioning?

Mr. BAKKE. With respect to the latter I have no knowledge.

Senator MONRONEY. Do you have knowledge as to whether anything was done to correct the malfunctioning of the autopilot after its landing in London and before its return?

Mr. BAKKE. No. If I did know, I don't recall.

Sir, the deficiency in the autopilot was written up in the maintenance log of the aircraft, what is known as the squawk sheet and the information was relayed verbally from the flight engineer on the preceding flight to the flight engineer of this flight. So there was knowledge of this condition. But since it is not a go-no-go item, the flight could of course be dispatched without the autopilot operating.

Senator MONRONEY. Is there evidence as to whether the engineer relayed this information to the pilot and copilot?

Mr. BAKKE. Since the pilot has the responsibility, among other things, for knowing the previous maintenance squawks, I would presume he had knowledge of it. I can't answer your question directly.

Senator MONRONEY. The engineer would have been in no position in the cockpit to have noted the abnormal attitude of the plane?

Mr. BAKKE. Right, sir.

Senator COTTON. This paragraph that you just read indicated that when the autopilot failed on a previous occasion, the warning light did not come on. I must have missed it, but as to the warning light, did it or did it not come on in this instance when this accident occurred?

Mr. BAKKE. The testimony of the crew is that it did not come on.

Senator COTTON. In either case?

Mr. BAKKE. In either case.

Senator COTTON. In the parlance of the pilots, referring to this, when the autopilot disengages and the light comes on, is that what they call failing safe?

Mr. BAKKE. No, sir; I wouldn't say——

Senator COTTON. Didn't someone in describing this particular accident say it failed safe. I wanted to know what they meant by it, and they said the light came on when the autopilot went out of commission. Apparently that wasn't accurate?

Mr. BAKKE. One might say that the autopilot failed safe in the sense that when it failed it disengaged itself, rather than applying hydraulic pressure to a control so as to roll it into an unusual maneuver. In other words, as soon as the autopilot became conscious of an extraneous or unusual signal, it immediately disengaged itself. It refused to accept that signal and transfer.

Senator COTTON. I recall that it is exactly the word they were talking about. It didn't involve the light. In this instance it did fail safe to the extent that when it became disengaged it became utterly disengaged so it wasn't contributing to some unusual movement?

Mr. BAKKE. Correct, sir.

Senator COTTON. Thank you.

Senator MONRONEY. Then had the pilot and copilot both been strapped in their seats ready to fly, watching the instrument panel, the failure of this light to come on would not have seen so important in throwing the plane into a dive?

Mr. BAKKE. Correct, sir.

Senator MONRONEY. It would have been almost instantly, if the instrument panel was being watched, that they would have detected the panel, and to have been able to bring about an immediate correction before the plane engaged in the 29,000-foot dive, is that so?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. As a safety investigator of many years standing would you say that the operation of high-performance true jet aircraft does require the performance at all times of two men strapped in their seat, ready to fly?

Mr. BAKKE. Yes, I would say so, sir. I would certainly make an allowance for some very brief departure from the cockpit, for instance, under circumstances where the remaining pilot can obviously accomplish a monitor of instruments and carry on the functions which normally would require two. If the departure were for such pro-

longed periods that the one remaining pilot were necessary to handle all the navigation problems, the communications, the monitoring of the flight instruments as well, then I would say that it is too long. Generally speaking, my answer would be: "Yes, it requires two men up front."

Senator MONRONEY. And that in the previous manuals issued by many of the larger airlines, it was the captain pilot's duty to attend to the social functions of the passengers and to make them feel at home and comfortable in his aircraft would no longer apply particularly with reference to jetplanes, is that correct?

Mr. BAKKE. It certainly should in no respect compromise the complete manning of the front of the airplane.

Senator MONRONEY. Do you require masks in full position in the cockpit for high altitude flying? Oxygen masks?

Mr. BAKKE. Again, sir, we don't as you know impose any requirements in this respect. The civil air regulations are no longer being actually written by the Board, so we don't require them. There are civil air regulations which do require that the masks be available.

Senator MONRONEY. Where?

Mr. BAKKE. I beg your pardon?

Senator MONRONEY. Where do the civil regulations require them? At what point? Overhead, underneath, strapped around their necks, or what?

Mr. BAKKE. It doesn't specify the part of the body or cockpit except to say it shall be immediately accessible. This is generally understood to be strapped around the neck in such a way that with one hand it may be pushed without delay into the face.

Senator MONRONEY. They are connected up?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. And ready for instant use once the mask is fitted around the head; is that correct?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. How much time do you calculate, if you lose a windshield—and there have been several evidences of windshields being cracked in the jetplanes in recent times—with resulting depressurization of the cockpit, would there safely be before the pilot, copilot, and engineer would be in a state of unreliability due to oxygen loss?

Mr. BAKKE. My recollection, sir, is that at 35,000 feet an average situation would be approximately 12 seconds of useful consciousness.

Senator MONRONEY. The reason I ask this is that I had occasion to fly at 40,000 feet in a SAS Caravalle. I went forward and asked how they liked the new French jets. The pilot, copilot, and engineer all looked like the men from Mars. They were not flying with the masks around their necks but fully in place at all times. I got the feeling that the pilot took his mask off for a 2-minute period to say he liked the plane and he got it right back on again. I don't know whether this is a part of the SAS regulations or the FAA regulations or Scandinavian air regulations. Are you familiar with whether other countries require men in cockpits above 30,000 or 35,000 to keep the oxygen mask on at all times?

Mr. BAKKE. I do know sir, that it is the custom among some of the carriers. This is a matter which has been in dispute for many

years. One school of thought says that one should not compromise the efficiency of the crew for the 999 times out of a thousand that oxygen is not required, by complicating cockpit procedures, communications between crew members and things of that sort, out of a desire to take care of this one very infrequent occurrence for which provision can be made on an emergency basis. This is one school of thought.

Another one is the one that has led to the requirement that you indicate for all crew members.

Senator MONRONEY. You say 12 seconds is the length of time before the pilot and copilot would be affected seriously by the loss of pressurization?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Do you know what the Navy regulations are on this matter?

Mr. BAKKE. At the time of our last study of the problems of hypoxia and high altitude operations, the taking of oxygen was required by all of the military services for all operation above 10,000 feet, and in many instances for operation below 10,000 feet as well.

Senator MONRONEY. Carrier pilots, I understand, take off and land, completely with oxygen masks in place at all times?

Mr. BAKKE. If the particular aircraft is a high altitude aircraft; yes, sir.

Senator MONRONEY. That is what I mean.

Senator COTTON. With regard to this particular flight, this particular plane—forgetting for the moment who was properly certificated to fly that plane—how many people in the crew were capable of flying that plane even momentarily? Just two?

Mr. BAKKE. Sir, I am not familiar with the extra capibilities of the flight engineer, for instance. So far as the minimum requirements are concerned, only two are called for. It might very well be in particular instances that the individual serving as the third flight member might well possess skills necessary to keep the aircraft aloft satisfactorily, but if so this is a matter of discretion or perhaps accident.

Senator COTTON. Was that the subject of some controversy between the pilots and airlines, about having a third pilot? I don't want to get into the merits of that contention, but was that involved in that controversy?

Mr. BAKKE. I understand that it was; yes, sir.

Senator MONRONEY. The reason we are spending so much time on this near accident is that this was perhaps the only case that we will have that does involve a true jet, is that correct, in your briefing? Or do you go into the violent maneuvers in which we lost the American Airlines pilots and the Braniff pilots?

Mr. BAKKE. No, sir. Neither of those reports have yet been completed by the Board. We hadn't contemplated going into those at this time.

Senator MONRONEY. Do you have anything in here regarding the landing gears, the buffeting that takes place, and the bruising of the cylinders and all on landing gears? Is there anything in this Idlewild incident where the plane had to circle for a long time to burn up its gas and come in?

Mr. BAKKE. I might say, sir, in direct answer to your question, it is not contained in this group of reports.

Senator MONRONEY. Since we are talking about jets, I wonder if you would like to help inform the committee—you investigated this incident, did you not?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. I think it would be helpful to the committeee at this point, since perhaps there will be no other jet cases, to detail what was the cause of the numerous landing gear difficulties and what was done to correct them, and what the present condition of this correction amounts to. I understand that they have had less frequent, if any, trouble since then.

Mr. BAKKE. So far as the details of the figures for the 707 landing gear are concerned, again I would suggest that a more complete description could be provided by the FAA. I could state that with respect to this particular accident it was apparent to the Board that the operation had taken place with the absence of a component of the leading gear known as the snubber, which is in effect a small oleo which is designed to place certain limits on the movement of the truck beam and also to take some of the shock out of that movement when it reaches certain extremes.

Senator MONRONEY. To make this clear for the record, as I understand it the wheels are dual wheels forward and backward.

Mr. BAKKE. Yes, sir. It is a four-wheel truck.

Senator MONRONEY. And as the plane breaks ground and the weight of the plane is lifted off the wheels, and as you get the turbulence of the takeoff, then there is a buffeting on those wheels which are linked together, and the violent rocking back and forth of these wheels has sometimes bruised the cylinder that must retract the gear. Is that a rough way of describing the situation?

Mr. BAKKE. What occurs is that with this violent oscillation of the truck beam, severe loads are placed upon a device, a little oleo known as the snubber, which, among other things, is supposed to damp the vibration or oscillation movement.

Senator MONRONEY. Like an old-fashioned shock absorber on the model T, very roughly.

Mr. BAKKE. Yes, sir.

If this device were removed, then, as we discovered in this particular case, the beam, which is a cylindrical structural member which supports the four wheels, is free to oscillate in such way that it comes in contact with certain bolts on other supporting structures above the beam itself. This contact of metal upon metal was sufficient to induce a failure in the beam which eventually caused it to separate completely after taking off from Idlewild.

This beam was not the strut, as we normally know it. It is the longitudinal member to which the four wheels are themselves connected.

Senator MONRONEY. This affects the normal operation of the gear?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. In this particular case there had been a previous squawk on this gear, had there not?

Mr. BAKKE. There had been some previous failures of the snubber. The snubber had been replaced in Europe on one previous flight, and had again failed.

Senator MONRONEY. And had again failed?

Mr. BAKKE. And had again failed. Therefore, on the return flight to the United States, the snubber was removed entirely and the flight was accomplished without the snubber. This action, as the committee is probably aware, was the basis for enforcement action by the FAA against the carrier.

Senator MONRONEY. To your knowledge, then, the FAA is trying within the earliest possible time to institute orders or actions to correct any failure of maintenance that may be appearing on the new equipment; is that correct?

Mr. BAKKE. Yes, sir. So far as operation without the snubber is concerned, I understand this is already accomplished.

Senator MONRONEY. This would not be optional equipment, but mandatory equipment for flight. So an airline which would violate that by taking off without them would be guilty of a breach of standard procedures of flight?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Have you had other evidences of these?

Mr. BAKKE. Any other evidences of——

Senator MONRONEY. Since the more stringent rules after the discovery of the snubber or failure to properly adjust the snubber?

Mr. BAKKE. This is the only accident we have had so far as the landing truck beam was concerned.

Senator MONRONEY. What I am trying to determine is whether you are having any more stuck landing gears?

Mr. BAKKE. The only other landing gear problems we have had with the 707, or any other jets, for that matter, to my knowledge, involve excessive loads on the gear as a result of hard landings or something of this sort, rather than malfunction of the gear itself.

We have had a hydraulic problem recently, as you may recall, in the emergency landing of a DC–8 at Buckley Field, Denver. Again this wasn't the kind of landing gear failure that we investigated in the Idlewild incident. So far as the particular failure is concerned, that was the only failure. We have not had a repetition of that one.

Senator MONRONEY. With regard to your recorders, are they sufficiently sensitive or geared so that you, the maintenance people, or the superintendent of maintenance for the airlines can detect when a hard landing has occurred, and the extent thereof?

Mr. BAKKE. We think so.

Senator MONRONEY. Do you think that any evidence of a hard landing that might not necessarily be reported by the pilot would be observed in the readings of the recorded data?

Mr. BAKKE. Yes, sir. I believe so.

Senator MONRONEY. Do you feel that the maintenance superintendents or those in authority for proper maintenance are using this recording data to check instances in flight which, of themselves, may not be disastrous, but which would be informative as to abnormal stresses on the aircraft, either in a hard landing or severe buffeting or overflying the speeds with which the plane is supposed to cruise?

Mr. BAKKE. Well, sir. I think I could best answer that question by stating that we don't think that this record is being used to the extent that it usefully might.

Senator MONRONEY. Why isn't it being used? This is an expensive piece of equipment. You have testified it costs some $6,000 to put it

in. It is required by law. It is not simply for the purpose of finding out why an airplane killed 125 people. It should be used to provide information for preventive maintenance and for the technique so necessary in keeping these planes flight ready. Certainly I feel that any airline should have someone in authority studying these after each flight. It is not too difficult to observe something which is not normal, is it?

Mr. BAKKE. If it were simply a matter of observing, say an extreme departure from normal, I think that this could be done by a visual scanning. You will recall that on the one recorder that I described earlier, where the flight conditions are inscribed on aluminum foil, in order to prevent the foil from being too wide and therefore the machinery too cumbersome, the scribers are staggered so that the particular information with respect to each of the five parameters that I understand earlier is, for a specific time, in a different point on the foil. After that foil is completed, just looking at it, unless one has a great deal of training and experience in the reading of the foil, does not make a great deal of sense. To pick any information off accurately requires the use of an overlay.

Well, I indicated earlier that I believed it was in the best interests of the industry to develop a more flexible tool; what I had in mind is the sort of things we have come to know in other areas where the head of a flight recorder may easily be lifted off the machine, brought into the operations office, put on an analyzer, and by the flick of a switch a printed copy can come out the other end, indicating exactly what parameters were exceeded at your point in a given flight. This is a sort of an ideal to which we should go.

Short of this type of operational convenience, there is a penalty in terms of time to read these foils. I am not trying to excuse the air carrier. I think this is a very useful bit of information. But I think the committee should know that there are difficulties. It is cumbersome to extract the best information from the present equipment.

Senator MONRONEY. One skilled man with the proper equipment could properly analyze the flights per day, since most of them would fit into the norm?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. He would be looking for the abnormal performance indicated. Therefore if he put a control of what the norm is and then superimposed that through overprinting or something on the recorder information, he would have instances stand out as warning posts that something had happened abnormally to the aircraft in flight which perhaps might not have been noticed by the pilot.

Mr. BAKKE. I personally would certainly welcome such a situation. In order for the committee to be fully informed as to what the difficulty might be here, remember where we speak of one such trained individual, were he located, to pick a point at random, at New York, this would hardly help the carrier were he confronted with a situation in San Francisco, Honolulu, or other places in the world. This would require other experts strategically located throughout the system. And as the use of the jets becomes more widespread, it is apparent that to be immediately available and operationally significant it might take a sizable number of folk.

Senator MONRONEY. If these planes carry 125 passengers at the rate of a little over $100 coast to coast, the revenue from such a flight is substantial. Certainly the safety of these people in flight, and the early warning you might say that these recorders would give, would indicate to me that proper maintenance would be enhanced by more careful attention to this recorded data.

Mr. Quesada, I believe only the day before yesterday, issued a warning about flying beyond the cruising speeds in an effort to set records transcontinentally. As I understand it, the margin between your cruising speed and a dangerous speed in these jets is very narrow. Is that not correct?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. What is the proper cruising speed of the 707 jet or DC–8?

Mr. BAKKE. I don't know that I could come up with a single figure here.

Senator MONRONEY. What is the difference in miles? As I understand it, there isn't a great deal of difference between the cruising speed and a dangerous speed. Is there not a larger margin before you get into a dangerous speed by putting more power on a piston-driven engine than there is in a jet?

Mr. BAKKE. Right. I can't give it to you in miles, Mr. Chairman.

Senator MONRONEY. You are satisfied that it is quite narrow?

Mr. BAKKE. Yes, sir.

Senator COTTON. Before you leave this particular accident, there is one point which I presume is obvious, but I want to be sure for purposes of the record.

On page 2 you say in the record:

> At approximately 2150 Captain Linch went into the main cabin.

Later you say:

> The Board concludes that this accident resulted from the inattention of the copilot to the flight instruments during the captain's absence.

I assume from that that the investigation indicated that the captain's absence in the main cabin was for a legitimate and necessary purpose, so that you attach no blame to him. Is that correct?

Mr. BAKKE. I don't think that is entirely correct. What we did find was that since it was known to Captain Peters that Captain Linch, who was the captain in command of the aircraft, was away from the cockpit, that it was therefore incumbent upon him to pay such attention to, among other things, the flight instruments, as would enable a reasonable monitor of the aircraft's altitude, height, and airspeed during that portion of the flight. This he did not do, and we would consider that this would be more directly related to the cause of the accident than the captain's departure from the cockpit.

Senator COTTON. Is there or is there not some existing regulation about a pilot leaving his seat for anything other than the completely necessary purposes?

Mr. BAKKE. Yes, sir, there is such a requirement.

Senator COTTON. Then the wording of this report doesn't attribute any of the blame for this accident to the captain, who was back in the main cabin. If he was back there drinking coffee or for any other

purpose, a completely necessary purpose, why wouldn't this report at least make that point as well as whatever the copilot was guilty of?

Mr. BAKKE. I suppose this is a matter of judgment. But in our investigations the Board uncovers many, many situations which reflect failure to comply fully with regulations and so on. But it is required to select those that it regards as causative or as directly pertinent to the particular accident. In this case, the Board did give a factual description of the captain's absence from the cockpit.

Senator COTTON. But it doesn't indicate whether it was a legitimate and necessary absence or one that could be construed as in violation of a regulation. Certainly, I know so little about this—I am not being critical. But it seems to me that this report, if the captain was back there for any purpose that was not completely necessary and legitimate, was a little unfair to the copilot in naming his conduct as the sole cause of this occurrence. There is nothing in the report to indicate whether the captain's absence was legitimate or not legitimate. I am not implying there was anything terrible about it. But it was either justified or it was in violation of some regulation. Is that not right?

Mr. BAKKE. That is correct, sir. If it was not justified, it certainly was in violation of the regulations.

Senator COTTON. Was it justified? Do you know from your own knowledge?

Mr. BAKKE. No, sir, I don't know.

Senator COTTON. It is rather difficult to handle these without reading them before coming to the hearing. On page 1, both the captain and copilot were penalized in some way.

Mr. BAKKE. Oh, yes, sir. So far as the FAA is concerned, enforcement action was taken against Captain Linch as well. He was subject to civil penalty in the amount of $1,000. So far as the report is concerned, I believe we cover the question of principle on page 8 in the last paragraph before the conclusion.

Senator COTTON. I don't want to take a lot of time on this. On page 9, if the FAA acted simply on the official statements in the report of the CAB, I don't see how they were justified in any way penalizing the captain, because there is not one thing in here that indicates that he was derelict in his duty in any way, shape, or manner. The only cause assigned is the copilot.

Mr. BAKKE. Yes, sir. As I indicated before, the reason for this was that regardless of how much subject to question the captain's action might have been, the Board was of the view that it was the copilot's negligence of the monitoring of the panel that was the causative factor, and then it chose not to ascribe blame with respect to the conduct of the pilot, or the captain.

Senator COTTON. I have just one more observation. This morning Chairman Durfee testified that it should be, and is, the responsibility of the CAB to investigate these accidents, and that the CAB should investigate all the accidents, including the minor accidents or the small plane accidents of general aviation, and then report to the FAA. I presume as a matter of actual practice that the FAA or somebody goes along representing them in many of these investigations.

Mr. BAKKE. Yes, sir.

Senator COTTON. And others go along, such as engineers from the plane manufacturers and representatives of the airline involved, and representatives of the pilots association, all these people. But actually the responsibility for the investigation and the report, the official report, is solely CAB, is that right?

Mr. BAKKE. Exactly correct.

Senator COTTON. If the responsibility is solely CAB, I just can't understand why this report should attach the blame, all the blame as far as anyone reading it is concerned, to the copilot, and then read on the first page that the FAA took some measures against not only the copilot, but the pilot. That was the point I wanted to make. Any comment you want to make I would be glad to hear.

Mr. BAKKE. Just one brief comment. When we open the records of an air carrier and delve as deeply as we do in accident investigations into air carrier operations, we very often disclose conditions that are not completely to the satisfaction, for instance, of the FAA. They may very likely be the cause for enforcement actions, and perhaps they should be, even though they might not be found to be causative with respect to the particular accident under investigation.

So far as the Board's judgment in this particular case, I believe this is one such instance. The Administrator found that a violation of the civil air regulations existed, whether or not the Board considered it causative with respect to this accident. He took action and we reported this factually as we did the factual situation.

Senator COTTON. I don't want to be guilty of starting any discord between the CAA and FAA. It was gratifying from the testimony to note the complete cooperation. But I can only conclude from what you have just said that if the CAB had been the sole agency acting here, that there would have been no action taken against the pilot.

Mr. BAKKE. Sir, I would have to remind the committee that the two acts involved are two completely separate acts. One of them involves an action which looks toward the enforcement of the civil air regulations, which is not the responsibility of the Board. The other is, of course, an enforcement action which is the responsibility of the FAA.

Senator COTTON. I just can't help but feel that this is a rather farfetched distinction.

Senator MONRONEY. I would share your views, Senator Cotton in that two men in the cockpit, both watching the instrument panels, would have twice as great an opportunity to detect the abnormal attitude of the plane as would the one man. And if the law requires two men to be there watching their altimeters and other instruments, then the absence of that man from the cockpit in violation of rules would be a causative factor of this. The same as you lose one motor; you still have three motors, and the three engines are capable of sustaining flight; but you have lost one of the factors that all regulations have built in for safety—and that is, two men watching that instrument panel.

Mr. BAKKE. If I might be permitted one final comment in this respect, in explaining the Board's judgment in this matter: The Board concluded that the responsibility of the copilot was exactly the same, whether or not the pilot in command was absent from the cockpit legally, even if the Administrator found that no violation should be

brought against the captain, that this wouldn't have changed the responsibility of the copilot. It was for that reason that the Board concluded that since in any event the copilot's responsibility was the same, his dereliction in this particular case was causative, and so stated.

Senator COTTON. But there is no suggestion—I want the record to show, I wasn't even suggesting that the copilot should be relieved of responsibility. But the conduct of more than one could contribute to this accident. I have noted here, as I have been reading this report, during your testimony, that when this plane got into this dive, or whatever you call it—when the pilot resumed and fought his way into the cockpit and got into his seat, that the pressure, the "G" pressure, or whatever it is termed in here, which is a little beyond my understanding, was such that both the pilot and copilot were struggling to have command of their own arms and feet and to be able to operate manually. It took the manual operation of the captain and the flight engineer to get the plane out of its nosedive. So that the very absence—the fact that one man was at the controls instead of two—how could you possibly say that that didn't contribute to this accident?

Mr. BAKKE. The only answer I can give, sir, is that the regulation does in fact contemplate from time to time that the captain will be out of the cockpit. It recognizes the fact that he must from time to time attend to the lavatory and perform certain——

Senator COTTON. That is what I was trying to find out from reading this report. If he had to leave the cockpit because of the necessities of nature, or something of that kind—obviously that is necessary. But there is nothing in this report that indicated whether his absence was a necessity—justifiable, legitimate absence—or whether it wasn't. We don't know yet, so far as this committee is concerned, because you don't know—do you? We do know that somebody thought it wasn't legitimate because somebody, FAA, took steps to punish him.

Senator MONRONEY. In further connection with jets and the problems of maintenance and working out the smaller items, some of which might at some time be contributory to a disaster, does your department continue to follow the servicing problems, such as the number of outages on windshields?

Mr. BAKKE. There is a system which is in use known as the "DMR" system—daily mechanical report system—whereby each air carrier is required to make reports of certain defects like, for instance, the windshield or window problems. These reports are transmitted by the carrier to the FAA, and they are circulated within the Government to, among other offices, our office. The DMR's are reviewed by our engineering folks, particularly as a source of information leads, for instance, toward accidents. We do have a continuing DMR review process. We have described personnel problems to the committee. As a matter of fact, few of our engineering folk, who would be principally involved in the DMR review, spend enough time in Washington to stay so close to the DMR's as to initiate action from the DMR's alone. I believe that it would be safe to say, as a generalization, that in view of our present situation we have to content ourselves with the use of the DMR's, for our accident investigation work. The FAA itself also

reviews DMR's, and I am sure that a description of what machinery they have and what procedures they go through in their review, and the actions taken as a result, can be explained to the committee. But so far as we are concerned, almost all of our DMR review is to satisfy our needs for leads and clews in accident investigation.

Senator MONRONEY. Then the job of collecting whatever it is that is causing the outages—the troubles with windshields—would fall properly in the FAA and not before your department, except as to clews when you suddenly lose one, or have a bad blowout at high altitude, is that it?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Your report, as I understand, on the two accidents—jet accidents that occurred—one in New York and the other out of Seattle on the certification or testing of the pilots in training—that is not ready yet?

Mr. BAKKE. That is correct.

Senator MONRONEY. Would you not care to make any comment at this time on things that you do know?

We are trying to keep out the guesses and, of course, the things that cannot be properly said with force of truth and fact in this study because it is certainly improper to jump to conclusions, particularly in something as vital as air safety.

I would rather postpone that unless you have some word that you might like to give us on that.

Mr. BAKKE. Only one, sir. I agree entirely with what you say. I would suggest that if the committee desires to explore these in detail—as you indicated earlier, this might usefully be done in executive session.

In the Peconic accident we did recover a flight recorder. There was some difficulty in the analysis of the flight recorder, but the final product, the recapitulation of the flight, was in my judgment an excellent bit of evidence that added materially to our investigation.

In the case of the Arlington accident at Seattle——

Senator MONRONEY. The first one you referred to was the Long Island accident, with the American Airlines plane testing pilots, and a violent maneuver on landing with two motors?

Mr. BAKKE. That is correct. In the case of the Arlington accident, near Seattle, no flight recorder record was available. The reason for this was a modification in the circuitry which had taken the system out of the landing gear scissor-switch circuit, so that the flight recorder no longer came on automatically after the wheels came off the ground.

Instead, a toggle switch had been installed in the cockpit requiring the pilot to actuate the system prior to takeoff.

The regulation requiring the use of the flight recorder is applicable to air carrier operations only. Since this was not an operation by an air carrier, Boeing was not in violation of the regulation. They have agreed since, however, to conduct all their operations with a flight recorder operating.

Very unfortunately, we did not have the advantage of a detailed flight record in the Arlington accident.

Senator MONRONEY. Both of these accidents occurred during the training of pilots, or familiarization of pilots, and requiring violent

procedure in bringing the plane in for a landing with two engines off; is that correct?

Mr. BAKKE. I would have said violent maneuver resulted. I would not describe the maneuver required to be conducted, or intended to be conducted, as violent.

Senator MONRONEY. You do not consider the two-engines-out landing a violent maneuver?

Mr. BAKKE. No, sir.

Senator MONRONEY. Is it done with all pilots, in checking out on the pure jets?

Mr. BAKKE. Yes, sir. The two-engines-out maneuver is done with all pilots of four-engine equipment.

Senator MONRONEY. Does that include one on each side or two on the same side?

Mr. BAKKE. Two out and on the same side.

Senator MONRONEY. That is probably the most violent or most difficult?

Mr. BAKKE. Most extreme.

Senator MONRONEY. And all pilots are required, before they are accepted by the line, or by the FAA as jet pilots, to be able to perform this maneuver?

Mr. BAKKE. A two-engines-out maneuver; yes, sir.

Senator MONRONEY. Does that require a landing with that outage?

Mr. BAKKE. I don't recall, sir, whether the operation specification actually requires the maneuver to be conducted down to a landing. My recollection is that it is required to be conducted in flight. I would have to suggest that you raise this with the FAA.

Senator MONRONEY. Now we pass on, I believe, at this point to other cases. We will try not to be so consuming of time, but because of the importance of the jet in the future of aviation, I believe this has been time well spent.

Mr. BAKKE. On February 3, sir, also, there was an accident——

Senator MONRONEY. What is the key?

Mr. BAKKE. This is "R", section R of the book.

A Beech Bonanza which crashed near Mason City Municipal Airport shortly after takeoff. The committee will doubtless recall that there was a great deal of public attention to the fatal injuries that were sustained by three entertainers of some repute. The interest that the Board had, among other things, in this particular accident, was the fact that there appear to be involved an operation on the part of the pilot who was not certificated to fly instruments, under weather in which he should reasonably have anticipated the need for instrument flying skill. This was an air taxi operation, an operation for hire. Here the Board found that the accident was caused by the action of the pilot, the poor judgment of the pilot in initiating a flight for which he was not qualified.

I might say, sir, if I could again invite your attention to section F of book 1, the Blue Book, that there were certain recommendations included therein with respect to air taxi operations, part 43 operations—excuse me, part 47 operations—which were transmitted to the FAA.

In addition, of general interest with respect to the problem of instrument competence in general aviation, we also have advised the

committee action has been taken this year by the FAA to require instrument competence among pilots as a condition of initial certification of the private and commercial pilots.

I might say in this respect just to be certain that there is no misunderstanding in the record, that this requirement was not applicable to all pilots in the sense of being applicable to all pilots presently holding certificates.

These requirements are applicable to pilots not yet certificated, or those to be certificated.

Senator MONRONEY. Was there anything connected with this accident that would indicate that the weather reporting had not been current or most recent?

Mr. BAKKE. I think the principal problem here was not the currency of the weather, because it was a difficult weather situation to forecast precisely, as much as it was the other conditions that existed.

Under the conditions of ceiling and visibility that existed and with the very sparsely settled area over which the flight was to be conducted—the absence of lights on the ground—this particular pilot might just as well have been on solid instruments. He had no reference on the ground to guide him. He was dependent entirely for attitude, height above ground, and airspeed on the instruments in his cockpit. And you will note from the report that this flight was also complicated by the fact that installed in this aircraft was a horizon, attitude indicator, in which the pitch-sensing of the instrument was reversed from that of the conventional artificial horizon, so that he might very well have been seriously confused as to the correction required during the course of this maneuver.

Doubtless this added to his loss of spatial orientation, resulting in his diving the airplane into the ground with fatal results to all on board.

Senator MONRONEY. On page 5, at the top of the page, in book 3, you indicate:

> Neither communicator could recall having drawn these flash advisories to the attention of Pilot Peterson. Mr. Dwyer said that when he accompanied Pilot Peterson to ATCS no information was given them indicating instrument flying weather would be encountered along the route.

Mr. BAKKE. Yes. By "instrument flying weather," meaning that he would be in cloud, for instance, or in precipitation so heavy that he could not see the ground.

The Board finally came out with the conclusion, even if he were not in this kind of weather condition, as dark as it was on this particular night, with the limited reference, lights, and so on, on the ground, he was, for all practical purposes, on instruments.

For that reason the instrument proficiency requirements of part 47 should be applied to him. It is a recommendation of this sort that we——

Senator MONRONEY. In other words, on a dark night, and with no REA lights, perhaps—although it is hard to imagine where there would not be a number on—he was flying without reference to a visual horizon and would have had to depend on his artificial horizon and his altimeter for other reference to the ground and the attitude of the plane.

Mr. BAKKE. Exactly.

Senator MONRONEY. You may proceed.

Mr. BAKKE. The next accident deals with the accident involving an American Airlines Lockheed Electra at La Guardia on February 3. I believe I should preface my remarks concerning this accident to say that I believe this is one of the most difficult investigations that the Board has undertaken in a long while.

In this report the Board again brings out its views with respect to the need for the flight recorder. As a matter of fact many of the views that we expressed this morning concerning the need for the enlargement of the flight recorder program originated with this accident.

We believe that it would have made a very valuable contribution to the information on which the report was based. In any event, so far as the accident itself is concerned, a Lockheed Electra, while making an approach to runway 22 at La Guardia Airport, crashed in the Rikers Channel part of the East River, approximately a mile, just short of a mile from the approach end of the runway.

Senator MONRONEY. That is the north-south runway, isn't it, on the west side of the field, roughly?

Mr. BAKKE. It is northeast-southwest runway. The magnetic heading of the runway was approximately 220°; 218°, I believe.

Senator MONRONEY. It is a short runway. It runs along the side of the field and not lengthwise of the field.

Mr. BAKKE. Yes. The back end of the report, the first illustration which appears on the report is in an approach plate showing the back course of the ILS, and shows the orientation of the two runways at La Guardia.

Senator MONRONEY. What is the length of that runway?

Mr. BAKKE. Just under 4,900 feet. The weather condition at the time of the approach was reported as 400-foot ceiling. The visibility as 2 miles. The flight was uneventual from Chicago to the New York area.

As he approached the New York area and was maneuvered around the back course of the ILS serving runway 4, there was some indication of a slowness on the part of the flight to correct to certain required tracks. This appears to have no significance so far as the subsequent flight was concerned. The flight did finally join the back course. It was cleared for a descent. The communications appeared to be normal in all respects. What little radar information we have does not appear to be unusual so far as the tracking after he joined the back course. He continued his descent over the range station, and shortly after acknowledging a communication with respect to the clearance by the tower to land, struck the water approximately 610 feet to the right of the final approach course, and a little less than a mile—a little less than 5,000 feet—from the approach end of the runway.

In this investigation a great deal of attention was focused on the adequacy of the system of aircraft altimetry.

This includes the instruments, the altimeters themselves, as well as the static systems and the transmission lines between the static sources and the instruments.

A large number of tests were conducted, all of which were monitored by or reviewed by Board personnel to determine whether there was any basis upon which we could expect to find an altimeter error.

We reviewed very comprehensively the history of this particular instrument, and the results of that review are described in the report.

Senator MONRONEY. In other words, on page 18 you show that on February 7, 1959, one of these stuck on three occasions; once at 2,350 feet, twice at 12,320 feet.

Is that correct?

Mr. BAKKE. That is correct.

Senator MONRONEY. And that a drum altimeter was installed as a third altimeter on American Airlines Electra N–6107A stuck at 1,310 feet on an ILS approach and landing at Detroit, April 3, 1959.

Are those the only evidences that you have of the sticking of this altimeter?

Mr. BAKKE. No, sir. If you continue on page 19 you will notice that we speak of 12 other drum type altimeter malfunction reports prior to and since February 3.

Five reports sticking above 9,000 feet; one report sticking, no altitude given; one reads 600 feet at any altitude; one reported lagging and sticking due to sticky stops; two reported barometric pressure knobs difficult to turn because of loss of lubricant; one read 1,000 feet off because of being out of calibration; and one was reported as malfunctioning; but except for serial number and date, no information was given.

Senator MONRONEY. This is perhaps the most sensitive instrument on the plane, isn't it; one of the most sensitive?

Mr. BAKKE. Yes, sir; it is a very sensitive instrument.

Senator MONRONEY. Today are they allowed to use these altimeters or are they only in the plane for reference and the ordinary type of two-fingered dials used?

Mr. BAKKE. To my knowledge, sir, after the instruments were removed from the Electra equipment, shortly after this accident, they had not been reinstalled on the Electra. Essentially the same instrument, however, is installed in, for instance, the 707. It is a drum-type altimeter the internal mechanism of which is very similar to the one with which we were concerned in the Electra accident.

The principal difference is that in the case of the 707, since it is designed for operation at still higher altitudes than the Electra, it was considered necessary to include in the system a computer, in effect, which is used to make continuous correction for errors of the system at high altitudes at which those errors become particularly critical, recognizing the fact that, after all, the altimeter system merely measures the pressure within a given linear distance.

The measurement of pressure close to the sea level is relatively simple because one deals in fairly large increments. But at the very high altitude, a given linear dimension requires far less change in pressure to obtain a particular change in linear measurement.

Accordingly, the instruments must be very, very precise to be useful at high altitudes. This system, in the unit installed in the 707, is known as the Kiffis system. It is a Kollsman design which puts between the instrument and the static source a computer which makes adjustment for the variables which must be corrected out to get a safe altitude indication at high altitude.

With this exception, the basic instruments themselves are very similar. We can say that so far as their operation generally is concerned, they have worked very well in the 707.

This does not mean to say that there are no other operational conditions which could affect their operation. For instance, difference in vibration levels in the two aircraft might very well be pertinent.

We have, as best we were able, attempted to measure all of the service test results which were available to us in the operation of this instrument. The Board found several particulars of information which are pertinent.

First of all, the captain's altimeter was misset—that is, the altimeter setting had been misapplied—to result in a total of 80 feet of error. This error was on the high side.

In other words, in reading his instrument he thought he was 80 feet higher than he really was.

Second, there is a built-in error of the static system which, according to the airplane flight manual, results in an error also on the high side not less than 30 feet nor probably more than 45 feet, which added to the eighty feet of error which had already beeen "cranked in" gave a total of 110 feet, or as much as 125 feet of error, also on the high side.

So he began this approach with an altimeter which we know was indicating erroneously between 110 and 125 feet.

Senator MONRONEY. How did you know the pilot had misset his altimeter?

Mr. BAKKE. Well, sir, of all of the instrument indications in the airplane which can be determined by accident investigation the setting of the altimeter is perhaps the most reliable. It is one that cannot change by impact forces, or, at least, typically cannot change by impact forces.

We believe that the altimeter setting indicated on the recovered instrument on the captain's side was the altimeter which existed at the time of impact with the water.

Senator MONRONEY. In other words, it read a different barometric pressure from that which the tower was giving at that time for the approach?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Did it have any similarity with any previous barometric pressure he might have received 50 or 100 miles out?

Mr. BAKKE. Yes, sir. The last altimeter setting given to him—I don't know exactly what the fix was over which he was given this, but my recollection is that it was the last altimeter setting provided by the company prior to entering the New York area.

Senator MONRONEY. And it was set at that—when you recovered the instrument it was set at the exact point at which the company had given him the altimeter setting in flight?

Mr. BAKKE. Exactly.

Senator MONRONEY. And not the accurate altimeter reading?

Mr. BAKKE. That is correct. This meant when he started the instrument approach he already had 125 feet of error on the high side. In attempting to determine what the ceiling was, we found that the five most recent ceilometer readings indicated three above 350 feet, and two below 250 feet.

Senator MONRONEY. Would you repeat that?

Mr. BAKKE. Three of them above 350 feet, and two below 350 feet.

Senator MONRONEY. I thought you said the second one was below 250. That is why I asked you to repeat.

Mr. BAKKE. By Weather Bureau standards for reporting ceiling, this is a 400-foot ceiling. If the majority of the ceilometer indications are above 350 feet, this is reported as a 400-foot ceiling. But with the situation being what it was, with two out of five having been reported less than 350 feet, it is quite obvious that we were faced with an undulating condition in which the true average was very close to 350 feet, with some portions of the ceiling going down below 350 feet.

Senator MONRONEY. When you say three were above 350 feet, and two were below, that wasn't reported as two below 350 feet. They either reported 300 or 250 or something, didn't they?

Mr. BAKKE. Exactly.

Senator MONRONEY. How much below? This we would like to know.

Mr. BAKKE. Sir, about the best answer I can give you right at the moment, although I am sure we can fill it in with a more precise answer, is that it was slightly below. It was small in numbers of feet. It wasn't so large, for instance, that we took note of it as possibly being down into the water, or something of this sort.

Senator MONRONEY. What is the minimum at that point? 200, 250 feet?

Mr. BAKKE. 400 feet.

Senator MONRONEY. A 400-foot minimum for that plane at that airport?

Mr. BAKKE. Right. So that a Weather Bureau report of 400 feet meant that the pilot had legal minimums, so to speak. In his descent, then, we could expect him to see lights on the surface at a true altitude of 400 feet above the water, at least momentarily, but he had maintained 400 feet he would have been in and out the bottom of this undulating ceiling.

The operation specification makes provision for a descent below the reported ceiling, not to exceed 50 feet. So that he could legally, if he saw lights, if he were contacted at 400 feet, could have descended down to an indicated 350 feet and maintained that altitude until he was ready to begin his final landing descent.

However, at an indicated altitude of 350 feet, with 125 feet of error, it is quite apparent that we have reduced the total separation between the surface below and the aircraft to approximately 225 feet.

Now, the question is raised, What happened to those 225 feet? We know by previous experience—as a matter of fact, in almost the same point in the Rikers Channel—that operation on a dark night over the sparsely lighted surface of the East River on the approach end of runway 22 produces a very distinct optical illusion with respect to attitude and height above the surface.

The Board has noted in its report at least three other instances in which we have investigated accidents which have occurred under similar conditions. Obviously it would be a little difficult for the Board to conclude that substantial altimeter errors occur only at night, only over dark-surfaced water areas, under conditions in which this type of situation confronted the crew.

We know that this sort of optical illusion which might induce the pilot to allow his nose to go down below the horizon and establish a rate of descent dangerously for this very small margin of clearance is possible, because it has happened before.

I might say, however, that we have no knowledge at this time as to whether the fact of a possible optical illusion would have been causative; whether it would have induced him to make the descent. The most conservative estimate we can make is that if there were any other condition in or out of the cockpit that caused him to permit the nose to be lowered so as to lose the remaining 225 feet, the visual references outside the cockpit were not sufficiently arrestive to call to his attention the fact that this descent was in fact taking place.

Now, so far as what was going on in the cockpit was concerned, we do know that from the moment he established the climb at Chicago, all the way en route until he entered the New York area, joined the ILS and went down the back course, the captain was continually on the autopilot, flying the autopilot in what is known as the "heading mode."

The operations manual for American Airlines expressly prohibits the use of the autopilot during the final approach. The checklist says that the autopilot shall be turned off before he initiates the approach. However, at this time the pilot sat throughout the entire approach with his hand on the course indicator, his left hand on the course indicator and his right hand on the elevator trim control, guiding the airplane through its descent, without directly manipulating the control of the airplane.

Senator MONRONEY. Let me ask how you know that. Is this the testimony of the copilot?

Mr. BAKKE. This is the testimony of the crew.

We regard this procedure as unusual. It is suggestive of a lack of complete confidence in the aircraft itself. We know that——

Senator MONRONEY. Wait a minute. It suggests a lack of confidence in the aircraft itself?

Mr. BAKKE. His own familiarity with, his own comfort and ease, you might say, in the cockpit itself. I don't mean to suggest that he had no confidence in the airplane as a flying machine. Perhaps I should better express it that it suggests a lack of complete familiarity and feeling of comfort in this new aircraft. I might say in this respect that he had a total—and here I had better check in order to be precise—he had a total of 48 hours and 13 minutes in Lockheed Electra aircraft, of which 12½ hours were in scheduled—sir, it was a total of 48 hours and 13 minutes in the aircraft.

Senator MONRONEY. That is exclusive of his simulator; is that correct?

Mr. BAKKE. Yes, sir; this is exclusive of the flight trainer I think we should call it.

There was no aircraft simulator as it is commonly known. Actually the flight trainer time consisted of the use of a conventional Link trainer with the flight director system installed, but as we point out in the report, neither the drum type altimeter nor the instantaneous vertical speed indicator with which the aircraft was equipped, was installed in the trainer.

So that this previous trainer time was expressly for the purpose of familiarization with the flight director system, and added nothing to his familiarity with the drum type altimeter or the instantaneous vertical speed indicator.

We concluded with respect to the use of the autopilot in the heading mode to or almost to the surface of the runway that the pilot would probably have been slowed considerably in reacting to instrument indications, and we believe that there is evidence that would indicate that this is a fact.

With respect to witnesses, the Board relies rather heavily on one particular witness who has testified that he saw the aircraft northeast of the LaGuardia range station, approximately a mile, at an altitude of what he considered to be 100 feet.

We think he is wrong when he says 100 feet. But when a large four-engine aircraft like the Electra passes at a low altitude under the conditions that existed this night, we have no difficulty in understanding that a lay witness might tend to exaggerate in his own mind how low the aircraft actually was.

But, from our review of the meteorological conditions that existed at the time, we know that to be seen, he couldn't have been over 400 feet. And he was still north of the LaGuardia range station.

If he were in fact at 400 feet, we also know that his altimeter must have read not less than 525 feet by reason of the error which we described earlier.

It is also completely illogical to assume that he could have been lower even than 300 feet for another reason. There are apartment houses and large buildings north of LaGuardia range station. We have no witnesses, although we canvassed the area at great length, that saw any aircraft at a low altitude north of this area. It is just inconceivable that he could have been below 300 feet because of these obstructions, without a large number of witnesses.

We therefore put him northeast of the range station at somewhere around 400 feet, with an altitude indication of about 525 feet.

Now, the question must be raised then, How do we get him down to this low altitude. This brings us back to the altimeter and the vertical speed indicator, and also of course to his manipulation of the autopilot controls. We find, with respect to the vertical speed indicator, that the calibration of this instrument is such that each degree of declination below a horizontal position in this instrument indicates approximately three times the rate of descent of the instruments behind which this pilot had been flying for approximately 19,000 hours.

In other words, if he were to fix a given position to which he might have been accustomed in previous airplanes with respect to a given rate of descent, say 500 feet, that in this particular airplane that same declination below the horizon would have given him for this airplane 1,500 feet per minute.

Obviously, it is impossible for us to go back and reexamine the mind of the pilot with respect to the extent to which this might have misled the pilot. If it misled him at all, we believe it must have been a small factor, because no single condition could have resulted, so far as an experienced air carrier pilot is concerned, in all of the error that was required to produce this sort of an accident.

We also have another problem which we see in the altimeter. Knowing that the index mark which identifies the thousand foot levels in the drum, and to appreciate what this might appear to be we invite your attention to an illustration—for which we must apologize, the printing was not of the best—in appendix C to the report which is contained in section (s). You will notice the upper right-hand picture which contains the face of a precision drum-type altimeter. To the right center of the instrument is the drum, which on this picture reads in vertical sequence 0, 1, and 2. On either side of the thousand foot indicators are two indexes.

The index to the left had already been suggested prior to this accident as a possible source of confusion to pilots who are familiar with the three-needle pointer type instrument, in particular with a small needle. One can compare that instrument on the left-hand side of the same page.

So that at night, particularly, the left-hand index on the thousand foot drum might appear to be the thousand foot indicator, the small hand on the pointer type instrument, in which case it would appear to be indicating 2500 feet.

Because of this, certain of the pilot group in American Airlines had recommended that this particular index be removed from the face of the instrument.

We have had some experience—very little; we think that this is more hypothetical than it is based on actual documentation, but we have had some reports that indicate the possibility of a similar type of confusion with respect to the index on the right-hand side of the instrument. Admittedly, the configuration, the shape, is not in the right direction.

We point out in the report, however, that the total length of time that is available for an instrument pilot, who is making an instrument approach, to refer to any one instrument is of very short duration. On the average, it is less than one-half of one second.

Considering the time required for the eye physically to move its fixation from one instrument to another, the total time which is available in average or typical instrument references is even less than one-half second. We believe that there is at least some likelihood that this index might have been confused for a 250-foot indication.

However, in neither case does the Board regard these two possibilities as exclusively causative. We recognize that these alone would not have produced the accident. What we say is that the error which they produced is in the same direction as the other errors to which we have referred.

Furthermore, no indication was had that any attention was given to this factor in the training program of the air carrier. No aircraft simulator was available prior to the bringing into service of this aircraft type, and, therefore, the carrier was dependent entirely upon aircraft flight time for training.

We would submit that had these instruments been made available in a comprehensive aircraft simulator program, that the possibility of any such confusion, as we have indicated is possible, would have been eliminated.

We also, of course, have already referred to the fact that the aircraft was displaced from the localizer final approach course approximately 610 feet to the right. This represents two full-scale deflections

on the cross pointer at a point a little less than 4,900 feet from the end of the runway.

Two full-scale deflections is, as any experienced instrument pilot will certainly admit, an excessive error for that part of the approach as close in as initial impact with the surface of the water at the time of this accident.

It is a clear indication that the pilot was experiencing some difficulty in maintaining the final approach course; that the difficulty of maintaining the final approach course might at least in part be attributed to the fact that he was using the autopilot as a directional reference insted of manually flying the aircraft itself—using the autopilot in this particular instance through the heading mode.

And so I would summarize: There is no one thing upon which the Board would focus all of its attention in ascribing probable cause. We find here, sir, a rather surprising accumulation of many small factors which coincidentally, almost without exception, all tended to work in the wrong direction. And with the accumulation of all of these factors we find that the margins left for vertical clearance above the surface in this approach had been completely compromised and the accident therefore resulted.

Senator MONRONEY. The thing that I find difficult to understand in this report, as in some of the others, is why the failure of Government facilities is never mentioned. I don't know too much about flying. I can see that a pilot can be mixed up by the rate-of-climb indicator which is, as you say, three times the speed that you have in the old-fashioned one, and they both look exactly alike, according to your illustration.

The difficulty on your altimeter—the plain fact remains, while you refer to it very briefly and somewhat in a glossary way, sensory allusions with respect to height and altitude result from visual reference of the few lights existing in the approach area. If you had had high intensity approach lighting on the north end of that 4,900-foot runway, this pilot could probably have come in all right, could he not?

Mr. BAKKE. Sir, with the minimums that existed here, had he had approach lights on this runway, it is my judgment that this accident wouldn't have happened.

Senator MONRONEY. I am glad to hear you say that. But I feel that in all fairness to the dead pilot, that there was a failure of Government to have better than 4,900 feet at LaGuardia—failure to have lights on this dark side. This is not a new system. This high-intensity lighting has been perfected and endorsed and yet we have been sitting on a dime for 3 or 4 years wrestling between the city officials, the airport authorities, the navigation authority, and everybody else while we face hazards in the air that exist in almost every major airport. It is one of the cheapest things in the world to correct, and one that could be corrected with an intensive drive within 30 days on Midway and many others. It would give pilots references to the ground and a lead-in to the end of the runway.

If you are going to have inadequate runways—and it seems like we are, because the Government hasn't been interested enough to spend enough money for adequate expansion of these fields as we get these higher performance aircraft—I cannot lead myself to believe that a

lot of these crackups on approaches and landing can be called pilot error.

Certainly, there will be contributing difficulties. There is also confusion and difficulty and strain and nervousness and split seconds looking at instruments as you come in to feel your way into a dark, unlighted approach, particularly over black water.

I think we ought to take the gloves off as we investigate these matters and attribute some of the blame to the Government—and to the airport.

Certainly I don't relish landing on a 4,900-foot runway with an Electra. I don't think very many other passengers like it, even though it is a good performing aircraft, particularly when you come breaking out of a 200- or 300-foot ceiling.

What is the landing speed? 135?

Mr. BAKKE. The approach speed would be 130 to 135 knots.

Senator MONRONEY. That gives a pilot very few seconds from the time the wheels touch until he is rolling out using up all that runway. I know you have the pilot-wheel propellers and they do stop pretty well. But consider the knowledge of the shortness of the runway, the darkness of the night, the up and down undulating ceiling that he faces, the new instrumentation in the plane with which he was not familiar, all of these things combined. The corrective could have perhaps been there had he had a broad pattern of light that was giving him a "come on" right down the middle to find that runway. Wouldn't you think that that would be possible?

Mr. BAKKE. I think there is no question of it, sir, that faced with a situation that he was confronted with, had he had approach lights, I don't believe this accident would have happened.

I might say in that respect that at the time that he came down to the low altitude to which I referred, say 225 feet, counting the error and the additional 50 feet to which he was allowed to come, that at that point he couldn't see the runway lights of the runway because of the dyke or seawall or whatever it is called at the approach end of the runway. At this particular point the runway lights would have been obscured to him, and they were the most prominent lights immediately available at this point in the descent.

These being obscured from him, he then had to rely on a few scattered lights of vessels on the surface, or perhaps a few markers. These were entirely too sparse for him to get a precise indication of height above the surface, and attitude.

I should like, however, to qualify my reply in this additional respect. That the Administrator is charged with the responsibility of establishing those operational conditions which are proper for a particular approach to a particular airport, recognizing the limitations of the facilities which exist. So that for any particular approach, with our without approach lights, according to our present regulatory concept, there is a certain set of operating conditions which apply. The visibility may be increased. The ceiling may be increased. But in any event, the absence of facilities does not of itself control the approval of the operation. It merely determines the conditions which shall apply.

The Administrator in this particular instance found that without these facilities a safe approach could be made with the meteorological conditions imposed on this carrier.

One other limitation, I think, should be noted. In the operations specification the carrier is cautioned for new pilots who admittedly will be troubled by some preoccupation with the finding of new instruments and controls. For instance, the problem of just looking for the landing lights, is sometimes a very confusing thing on final approach.

Recognizing this, the operations specifications call for an additional 100 feet of ceiling as a minimum for pilots with less than 100 hours in the new aircraft. This specification was applicable to this pilot. But there was an additional provision of the specification which allowed the company to waive this additional limitation for certain pilots to be selected by and at the discretion of the carrier. The carrier chose to waive this additional operating limitation upon this particular pilot. Had those limitations been in force, this pilot could not have accomplished this approach.

We think that there is something to be desired in a situation which points its way toward a desirable end; namely, additional limitations for pilots who might be expected to be preoccupied with new equipment, and then waives them, when they become bindiing in a particular case. Our recommendation with respect to this condition has also been sent to the Administrator.

Senator MONRONEY. Was this man started in his Electra service, or at this particular time?

Mr. BAKKE. The waiver was issued a little more than a week before the accident. He had already been through his training and he had a total of, I think, five trips in the airplane when the waiver was issued about 8 days before the accident.

Senator MONRONEY. That would give him about how many hours?

Mr. BAKKE. This is covered on page 15 of the report, sir. "On January 25, when he had 12 hours and 32 minutes of flying the Electra in scheduled operations. . . ."

Senator MONRONEY. And they waived it after 12 hours in the plane?

Mr. BAKKE. Twelve hours and 32 minutes in scheduled operation. His total training was, I think, 24 hours. Excuse me. He had 12 hours of training, a total of 24 hours; approximately 24½ hours in the airplane at the time of this waiver.

Senator MONRONEY. And the minimum at that point was 500 feet?

Mr. BAKKE. It would have been 500 feet of ceiling and another half mile in visibility.

Senator MONRONEY. But there is a question of whether the ceiling was at 500 or not?

Mr. BAKKE. Right.

Senator MONRONEY. There are two reports below 350 and three above, which might indicate the maximum was 400.

Mr. BAKKE. Four hundred feet is the minimum. The question was whether it was at 400. It was an undulating ceiling, some of which was close to 400, some of which was under 350.

Senator MONRONEY. Is it still 400 for Electras at LaGuardia?

Mr. BAKKE. To my knowledge it still is.

Senator MONRONEY. With the extra 100 feet penalty for new pilots?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Unless waived?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. That runway is closed now, is it not?

Mr. BAKKE. I believe it is the other runway that is closed. 31 and 13 are closed. That is right. That means the only runway available at LaGuardia is——

Senator MONRONEY. Fortunately a great many of their flights have been transferred to Idlewild. This is still unlighted at the end. Are there any plans to your knowledge of ever lighting up this dark approach? Do you know of any plans to protect the public by giving them adequate approach lighting on the north end?

Mr. BAKKE. I have no knowledge of any. There were none in existence at the time of our hearing, for example, and I know of none since.

Senator MONRONEY. This is involved in navigation and a lot of other things, I understand. It is one of the problems they have. The authority that operates LaGuardia also operates the Port of New York.

Mr. BAKKE. Yes, sir.

The record indicates, if I might mention one thing, that there has been difficulty with respect to the erection of towers for approach lights in the Rikers or near the Rikers channel because of possible interference with navigation in the East River.

Senator MONRONEY. These have to go out how far?

Mr. BAKKE. Any amount of light would be helpful. I believe the standard approach is 3,000 feet.

Senator MONRONEY. In other words, a normal approach lighting would probably go out for about 1,000 feet or more, wouldn't it?

Mr. BAKKE. About 3,000 feet.

Senator MONRONEY. That would give him an absolute carpet. Once he focussed on that he would know his glide path and everything.

Mr. BAKKE. Yes, sir.

Senator MONRONEY. And center him right in on the runway?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Do they have any approach lighting, modern approach lighting, at LaGuardia at all?

Mr. BAKKE. The ILS system, as you probably know, sir, serves runway 4. There are approach lights on runway 4, on the primary system.

Senator MONRONEY. I don't think it is modern. I think it is old style, or hodgepodge, crazy quilt approach light that bears no relationship to any standard type.

Mr. BAKKE. It is a neon bar system.

Senator MONRONEY. It is not a modern high intensity lighting that we have on the south end of Washington National?

Mr. BAKKE. It does not conform to the present standards for approach lighting of the Administrator.

Senator MONRONEY. And your ILS is merely the instrumentation of going over the outer marker at altitude and maintaining a glide path in. His radio guidance system into the field would require ground reference at below what altitude?

Mr. BAKKE. For the back course, on runway 22, he would have no glide slope at all. His height above water, above the surface, would have been determined entirely by reference to his altimeter through the entire approach until he was able actually to see the surface at LaGuardia.

This is unlike, of course, the front approach in which he would have had the advantage of the localizer—of the glide path as well as the localizer. Here he had only the localizer to serve him in lining up the aircraft.

Senator MONRONEY. He had no radar approach on it?

Mr. BAKKE. No, sir. There was a——

Senator MONRONEY. What happened to the radar?

Mr. BAKKE. There was a surveillance radar available which was used for air traffic purposes. But as soon as he was established on the localizer, and as soon as they had determined that adequate separation existed, they no longer monitored his approach. We could get no complete information after, I think, about a mile and a half southwest of New Rochelle. They then stopped monitoring this particular approach and the rest of the approach was up to the pilot, based on his cockpit instrumentation.

Senator MONRONEY. Had they kept a landing radar on him, I mean under such conditions as you have under GCA, then he would have been advised if his altitude was too low, too high, or off course, would he not?

Mr. BAKKE. If they had had a precision system on this runway, which they do not and did not at the time of the accident.

Senator MONRONEY. Do you know whether they have it yet or not?

Mr. BAKKE. I have no knowledge of that, sir.

Senator MONRONEY. In other words, there are a great many factors existing in this crash that cost the lives of a great many people. If proper equipment, which is now available, had it been installed all the way from the length of the runway, as crude as that, to the approach lighting to the GCA, they could have landed this plane absolutely safely, regardless of the instrumentation or even the weather conditions, would you not say?

Mr. BAKKE. Sir, I think any of those additional facilities would have served to avoid this accident.

Senator MONRONEY. Isn't this the case in so many accidents, that additional equipment, ground or otherwise, allows the forgiveness of certain other errors—that proper aids, navigational and otherwise, would have made the accident nonfatal and perhaps not even anything more than a routine landing?

Mr. BAKKE. The only word of caution that I might make here, sir, is that invariably the addition of these facilities is followed by a reevaluation of the minimums.

Senator MONRONEY. We use up all the safety by crowding a few more planes in.

Mr. BAKKE. If we add a glide path, the minimum might go down to 200 and a half, and then we face another set of minimums applicable to particular operations, and of course, we again repeat the process, namely, are these particular minimums adequate for these particular facilities? My answer to your question of course had to do with the circumstances with which this pilot was confronted. Under these conditions, obviously these other facilities would have helped avoid the accident.

Senator MONRONEY. From the wreckage of the plane, and as you have reconstructed it, did the plane hit the water on a glide angle, or did it hit it an unusual dive angle?

Mr. BAKKE. No, sir. It was a very shallow descent.

Senator MONRONEY. In your mind there would have been no confusion over the handling of the prop pitch which is the only method of acceleration or de-acceleration in the air of an Electra?

Mr. BAKKE. There was no reason to suppose this at all, sir, so far as prop pitch was concerned. It was normal to the power and prop setting. That is, in the examination of the wreckage we found it to be normal for the power and prop setting.

Senator MONRONEY. What I mean is, when you push the throttles forward, for instance, or the pitch of the blades forward to increase the speed, do you push the pitch control forward to increase the speed as you do on a conventional airplane?

Mr. BAKKE. There is only one control, sir, the throttle control.

Senator MONRONEY. It is pitch of the propeller. You have a constant speed?

Mr. BAKKE. It is a single power control. There aren't two separate controls. They are not two separate sets of controls.

Senator MONRONEY. Are you sure? The Electras I have seen I think you have four—just like you have four controls on the motors, you have four controls for the propeller pitch.

Mr. BAKKE. Yes, sir.

Senator MONRONEY. What I am asking is, this pilot, with I think you say 19,000 or more hours, is there anything different in the control of the speed of the plane which a pilot with a slight number of hours would have found confusing? Does it relate itself to what he had been accustomed to in handling the power controls in conventional aircraft?

Mr. BAKKE. I would say, if anything, sir, the movement required, the action required on the pilot, is of the same sort, and if anything, in the Electra, is simpler.

Senator MONRONEY. But it would be in the same general direction as if he was flying a conventional aircraft?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. It is not reversed or anything like that?

Mr. BAKKE. That is correct.

Senator MONRONEY. Is there anything in your experience that might indicate that a pilot, who has had many thousands of hours of piloting in a conventional type aircraft, that the habits of years in reading altimeters or other things that he has been accustomed to, takes a little more adjustment so that he can overcome this lifetime of habit as he has transition to a new type of airplane?

Mr. BAKKE. We have not ever had occasion to relate such things as length of service, amount of time, age or anything of that sort specifically to ease of adjustment to new aircraft.

We can say this, it is very general in nature. For instruments like this instantaneous vertical speed indicator, for the altimeter, for such devices as the RMI, for instance, in which there is a reverse sensing of direction reference for instruments like these, it takes some time for familiarity to break the habits of experience.

I cannot give you any precise indication of what the difference would be for a man with 10,000 hours as against 20,000.

About the only experience that we have had as the result of our safety investigation experience is that there is a sufficient impact so

that provision should be made in the training program to insure all of the experience necessary to eliminate possible reversions to old habits.

We believe that the best insurance of this kind of training is the aircraft simulator.

Senator MONRONEY. And 28 hours in the aircraft, on scheduled flying, would not necessarily be enough to waive the additional 100 feet required for minimums for landing in your opinion, would it?

Mr. BAKKE. This is our conclusion.

Senator MONRONEY. So one of the major points, and I notice you listed it as No. 1, is limited experience of the crew with the aircraft type?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Since the purpose of this study is to try to ascertain what can be done to improve air safety, would you say from your experience in these new types of aircraft, that a greater amount of pilot familiarization, both simulated and actual air conditions, might be conducive to a greater degree of air safety?

Mr. BAKKE. By all means, sir.

Senator MONRONEY. It is now 5:15. There are several other accidents that we would like to go into.

How many yould you say that we need to go into?

Mr. BAKKE. There are three others that we have available which we might discuss with you.

One we have reviewed briefly, the Riddle C–46 at Alma, Ga., the cargo aircraft, which burned in flight.

There are two others, one at the Washington Airport which went through the ILS shack. And the American Airlines Convair 240 at Chicago, a cargo flight, which landed or struck a tower while on an approach to Chicago Midway.

These are the two remaining which we had contemplated to brief the committee on at this time.

Senator MONRONEY. What about the TWA cargo flight? Did that happen in 1959?

Mr. BAKKE. It happened in 1959.

Senator MONRONEY. Don't you think that is significant enough——

Mr. BAKKE. The hearing was held last week.

Senator MONRONEY. You have not enough information to give us?

Mr. BAKKE. No, sir.

Senator MONRONEY. Suppose we recess at this point, and start at 10 o'clock tomorrow morning, so we can complete this phase—reports on the investigations which have been completed.

If you find that you might be able to furnish us with helpful information about some of the accidents that have been investigated but not completed, we would like to have those.

We recognize that you are anxious to make your testimony as factual and as complete as possible, and we will not insist on going into the conjectural part of unproven leads at this time.

The committee will stand in recess until 10 o'clock tomorrow morning.

General Quesada will follow after we complete the hearing of Mr. Bakke in the morning.

(Whereupon, at 5:18 p.m., the subcommittee was adjourned, to reconvene at 10:00 a.m., Tuesday, January 12, 1960.)

AIR LINE DISPATCHERS ASSOCIATION INTERNATIONAL, AFL–CIO.
Arlington Va., January 11, 1960.

Hon. A. S. MIKE MONRONEY,
Senate Office Building, Washington, D.C.

DEAR SENATOR MONRONEY: In the interest of being helpful to your committee, we offer the following information:

(1) With reference to the General Airways DC–3 accident in Texas, had there been a dispatcher, three situations which brought on the fatal crash would have been prevented. First, the dispatcher cannot and will not release a pilot to fly if he is going to exceed the flight time limitations. Each dispatch office continuously monitors pilot flight time. Second, the dispatcher would not have released the flight to proceed into an area of known moderate icing and in this case it was evident that the conditions en route would probably be beyond the airplane's capacity to handle. Third, long before the pilot had reached any extremity as to fuel the dispatcher would have ordered him diverted to a suitable alternate. Were no suitable alternates available, the trip would not have been released. One item that we recall may not have been mentioned, and correct us if we are wrong. The pilot filed VFR and VFR conditions were not indicated. On this additional count a dispatcher could have prevented the tragedy.

(2) General Airways was a part 42 operator, and as such was not required to have dispatchers. We have on occasion discussed with the Irregular Air Carrier Branch of the FAA the possibility of requiring certificated dispatchers in part 42. The Air Line Pilots Association is on record as endorsing this idea. However, the FAA believes that imposing such a regulation would put an unnecessary economic penalty on the irregular carriers, and further, because of the irregular nature of nonsked operations, they could not determine where to base those dispatchers if they required them. May we point out that in the United States of America there are certain contract dispatch organizations which would furnish services to nonskeds for a fee. We are not in the business of promoting these contract groups, but it would serve as an answer.

(3) Although certain irregular air carriers, or supplementals, are not required under part 42 to have dispatchers, some of them do, such as Transocean, which runs a fine show, and Ovearseas National, and others.

It might be entirely feasible to require dispatchers for the large supplementals, whereas, the smaller nonskeds might find it rather impossible. On the other hand, the large supplementals could very well lease their dispatch services to the smaller carriers if necessary.

(4) Many major trunklines have meteorological services in one form or another, but most of them have such services at only one central base. Therefore, less than one-third of this Nation's carriers have weather men. The fact is, the dispatchers, who are trained in meteorology, are the airlines' weather experts in the greatest number of cases. Meteorology is a tool of the dispatcher, and he employs this knowledge in his work.

(5) You are entirely correct in stating the dispatcher has full authority to stop a trip at any time it is on the ground. He has full authority under the regulations to cancel, hold, or release.

(6) A statement was made to the effect that the weather or dispatch service is a secondary check. Under Federal regulations it is a primary check. Flights originate on the coauthority of pilot and dispatcher. No flight can start without the concurrence of both parties and there is the system of checks and balances. The fact of the matter is that the decision to fly or not to fly is often made by the dispatcher before the pilot reaches the field, because the dispatcher has been studying the conditions for hours beforehand, and he is obligated to make his decision as early as possible so as not to discommode the passengers. Every attempt is made to call the pilot at home to gain his concurrence.

However, let us remember that either man may cancel the flight without the approval of the other. That is, even if a dispatcher thinks a flight might be safely flown, the pilot may choose not to fly for reasons of safety. In jet operation, the planning stage for flights is begun 4 hours or more before a crew comes to the field.

There are many reasons, both safetywise and economic, that dispatching is put to good use. The regulations prevent unilateral judgment.

Yours truly,

R. E. COMMERCE, *President.*

REVIEW OF THE FEDERAL AVIATION ACT
(Air Safety)

TUESDAY, JANUARY 12, 1960

U.S. SENATE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
SUBCOMMITTEE ON AVIATION,
Washington, D.C.

The subcommittee was called to order at 10:08 a.m., in room 5110, New Senate Office Building, Hon. A. S. Mike Monroney presiding.

Senator MONRONEY. The Subcommittee on Aviation will resume its hearings on the air safety matter.

I understand that Mr. Ross Newmann, the General Counsel, would like at this time to clear up a misunderstanding we had regarding appeals to the CAB in various cases.

We would be happy to hear you briefly to straighten that out.

STATEMENT OF OSCAR BAKKE, DIRECTOR, BUREAU OF SAFETY, CAB; ACCOMPANIED BY ROSS NEWMANN, ASSOCIATE GENERAL COUNSEL, CAB; MARTIN CLARK, BUREAU OF SAFETY, CAB; AND ED HODSON, CAB

Mr. NEWMANN. Thank you, Mr. Chairman. I would like to clarify the record if I may respecting the respective responsibilities of the Civil Aeronautics Board and FAA regarding actions to be taken against air carriers.

I think we should keep in mind that there are two types of operating authority which are needed. First there is the economic operating authority, which will be given by the Board, usually in the form of a certificate of public convenience and necessity. In addition, before an air carrier can start operations he would have to have a safety authority which would be given by the Administrator of the FAA, and this would be in the form of an air carrier operating certificate.

For violations of the economic provisions of the statute, title 4, or any of the Board's economic regulations, the Board's own office of compliance can bring an action, and this would be before an examiner of the Board. There would be no civil penalty in this case and the Board then would issue an adjudicatory decision.

With respect to violations on the safety side, the Administrator will be the enforcement person who would be responsible, and he would have two courses of action. First, he could levy a civil penalty, or if he desired he could move against the air carrier operating certificate. In this case it would be under section 609 where he may either suspend or revoke. Then if there is an appeal the appeal would come to the

Civil Aeronautics Board, in which case you would have an adjudicatory hearing.

So that the economic violations would be handled by the Civil Aeronautics Board, the violations on the safety side would be brought by the Administrator.

Senator COTTON. In our colloquy yesterday on this subject there was some distinction made between action resulting because of alleged violations by personnel, by pilots or others, and actions due to the failure of an airline to have proper equipment or safeguards. Is there a distinction between the way those two classes of cases are handled, and a distinction between those two classes in relation to appeals?

Mr. NEWMANN. In those cases the Administrator would have the authority to levy a civil penalty, either against the airman or——

Senator COTTON. You are referring to which by those cases? The equipment cases?

Mr. NEWMANN. If the Administrator wished to move against the carrier, he could either levy a civil penalty or he could bring an action under section 609 which looks toward revocation or suspension of the air carrier operating certificate. If he wished to move against the individual, he can again levy a civil penalty or he could either suspend or revoke the airman's certificate pursuant to section 609, and in that case any appeal would go to the Civil Aeronautics Board.

Senator COTTON. In the first case, that was the subject of our questioning yesterday, the case which does not relate to personnel, to pilots, or to an individual but does relate to complying with requirements for mechanical devices and safety, in that case if the Administrator is the moving party, the appeal is to—there is an appeal to the Civil Aeronautics Board?

Mr. NEWMANN. If he chooses to levy a civil penalty, the Civil Aeronautics Board does not come into the picture. If he chooses to proceed under 609 and either suspend or revoke the air carrier operating certificate, and if there is an appeal from that action, then it is an appeal to the Civil Aeronautics Board.

Senator COTTON. In the first case, where he is simply seeking to invoke a civil penalty, the appeal is directed to the courts?

Mr. NEWMANN. Yes, sir.

Senator COTTON. And not to the CAB?

Mr. NEWMANN. The Civil Aeronautics Board is not involved.

Senator COTTON. Thank you. That clears it up very well.

Senator MONRONEY. Thank you very much.

Senator COTTON. Mr. Chairman, could I also make sure—my attention was brought this morning to another matter—could I clear that up with a question?

Senator MONRONEY. Certainly.

Senator COTTON. I think Mr. Bakke can answer it.

Yesterday, at some length, perhaps at too great length, I made inquiry of you, in the case of the 707 episode, about the pilot not being at the controls. Someone this morning suggested to me that perhaps there was a misunderstanding, that this rule, made by the FAA, necessitating the presence of the pilot in the cockpit, may have been made since that accident and might not have been in effect at the time of that accident. Is that the case?

Mr. BAKKE. Well, sir, the rule which requires the presence of all required crew members at their respective stations has been in the civil air regulations for many, many years. As a matter of fact it was discussed at great length in one of the most recent complete overhauls of the regulations which was accomplished in 1953 and 1954.

So that the regulation, the sense of which is that a required crew member must remain at his station with his safety belt fastened, has been in the regulation for many years and was in effect at the time of this accident.

The Federal Aviation Agency has recently clarified that regulation. However, it is my recollection that the action which was taken clearly by its own terms was a clarification, rather than the pronouncement of a new policy in this respect.

The problem that we had yesterday was not with respect to whether the captain might be away from his station, because clearly the regulations then, as well as now, contemplate that he might, for reasons that are natural, for reasons that are normal to the operation.

In this particular case the captain left the flight station to attend the lavatory.

Senator COTTON. In which particular case?

Mr. BAKKE. In the 707 dive.

Senator COTTON. Proceed.

Mr. BAKKE. He spent as best we can determine something close to, though obviously it was difficult to establish precisely, but something close to 15 minutes away from the station. There was some evidence that he exchanged conversation, engaged in some conversation with occupants of the aircraft on his way to the lavatory and on the way back.

Now the question of course arose as to whether this was excessive. His absence from the station, the Board took no exception to, recognizing that this was a legitimate reason for leaving. Whether he stayed away too long, however, was examined.

The Board finally determined, however, that it need not deal with this issue expressly so far as this pilot was concerned because in any event they did not regard it as causative, because whether he was legitimately away from the station or not, there followed a responsibility upon the copilot which was not fully discharged. And it is in this respect that the Board finally determined that the cause of the accident most nearly lay with the copilot's failure to continue the monitor of the flight instruments.

Senator COTTON. I thank you for that. I wanted to make sure that I hadn't inadvertently been unjust in the matter of the existence of the rule. The matter of the chain of causation we may still have the privilege of disagreeing on. There is no need to go into it further. I didn't intend to emphasize it further by this inquiry.

Senator MONRONEY. Thank you very much.

May I ask if General Quesada has arrived yet? We are on a close schedule this morning and we would like to take his opening statement as soon as he gets here so that we will be sure to complete it. In the meantime we will go forward with Mr. Bakke. I believe you were going to detail two or three more accidents that you felt were illustrative of the need for corrective action, or the tightening of procedures.

Mr. BAKKE. We got to Riddle Airlines.

Senator MONRONEY. We were on the American Airlines cargo case which we hadn't completed.

Before you begin, we have a letter from the Airline Dispatchers Association, Arlington, Va., with reference to the General Airways DC–5 accident, where the overfatigued pilots cleared themselves for flight into obviously bad and dangerous weather conditions. I would like to insert this in the record at the point at which the General Airways accident discussion occurred.

Mr. BAKKE. The American Airlines cargo flight, a Convair 240, crashed in a railroad yard southeast of Chicago Midway Airport on March 15, during an ILS approach to Chicago Midway. The aircraft struck a 69-foot steel tower during the approach, continued straight ahead, crashing into the railroad yard. The aircraft and its contents were destroyed, but neither pilot was fatally or seriously injured.

Senator MONRONEY. This was 5:30 a.m.; is that correct?

Mr. BAKKE. No, sir. This was at——

Senator MONRONEY. 5:30 p.m.

Mr. BAKKE. No, sir. It would be about 1 o'clock in the morning. It would be 53 minutes after midnight, c.s.t. In this particular case we found that the flight which had proceeded from LaGuardia to Detroit, landing at Detroit because of adverse weather at Chicago, was redispatched from Detroit to Chicago. A conversation was had between the pilot and the dispatcher, the dispatcher, of course, consulting with the company meteorologist. It was agreed that there was thunderstorm activity in the vicinity of Chicago, but it was the dispatcher's and the company meteorologist's judgment that the weather at Chicago Midway was not likely to go below minimums. Accordingly, the flight was dispatched and he proceeded to Chicago.

Senator MONRONEY. What was the minimum at Midway?

Mr. BAKKE. The minimums for this particular localizer approach, I believe—Sir, I don't recall the minimum visibility, but for this particular operation the minimum was 400 feet in ceiling, which is approximately a thousand feet mean sea level at the Chicago area.

Senator MONRONEY. You say on page 1 of this report, at the time of the accident the company's prescribed cargo minimum ceiling of 300 feet existed. The minimum was 1 mile in range, one-fourth more than the cargo minimum. Are there two sets of safety, one for passengers and one for cargo?

Mr. BAKKE. There are lower minimums authorized for cargo operations; yes, sir.

Senator MONRONEY. What effect does this have on people on the ground? They are people. Pilots are people. If it is unsafe to operate a passenger plane into an airport at 400 feet, why is it safe to operate a cargo plane into the same airport at 300 feet?

Mr. BAKKE. I don't know that I could give a completely safe answer to that, sir. I might say that in any methods of measuring physical phenomena where it is possible to attach some quantitative measure, there is always a portion of that measure which is roughly called the top of the curve, so to speak, where the curve flattens out and where it is difficult to establish a distinct difference in level of safety, where the level of safety may be very, very small, and where a resolution in one direction or another requires very fine judgment. But the best answer I can give is that it was apparently determined

that the difference is sufficiently small so that it could have been authorized for cargo operations, but not for passengers.

Senator MONRONEY. I understand this is a fixed rule of the FAA, is it not?

Mr. BAKKE. Yes, sir.

Senator MONRONEY. Or is this a company rule? This is an FAA rule that there is a lower ceiling permitted for cargo, lower visibility than permitted for passenger planes, is that correct?

Mr. BAKKE. FAA does authorize it in the air carrier specifications, yes, sir.

Senator MONRONEY. We will have to ask about that when the FAA comes up. Certainly the type of the cargo or passengers in the plane does not change for the people living in places surrounding the airport. We have had one bad accident at Midway, on which presumably the report is not yet ready. It was very bad in relationship to the death of people living nearby. I cannot understand why it is more safe to fly a cargo plane, excepting for the exposure of the people inside the plane, than it is to fly a passenger plane. If it is safe for one, it should be safe for the other.

Senator COTTON. Is that discrimination, that difference, entirely an action of the FAA? That is not in any sense participated in by the CAB?

Mr. BAKKE. No, sir. We have no direct responsibility with respect to the making of regulations or specifications.

Senator MONRONEY. Presumably you did have the rulemaking facility until January 1 of last year.

Mr. BAKKE. December 31.

Senator MONRONEY. When the CAB had it was there a differential existing for cargo and passenger aircraft?

Mr. BAKKE. Yes, sir, there was. I might say, although this doesn't alter the question of responsibility, this distinction was not made expressly in the regulations. You will recall, Mr. Chairman, that the relationship between the Board and Administrator of the CAA was such that the regulations laid down some rather broad policy, delegating the specific delegation of minimums to the Administrator, and the particular minimums that we are talking about here were contained in the air carrier operations specifications which were written even then by the Administrator of the Civil Aeronautics.

I did wish to take this opportunity, Mr. Chairman, if I might, on the subject of exposure of persons to aeronautical hazards generally——

Senator COTTON. Before you take that up, in order that we may not lose this continuity, permit me to ask you this: has the CAB, either before or since the creation of the FAA, as a result of any of its investigations of accidents, or for any other reason, made any recommendation to the FAA that the differential between the rules for cargo and for passenger craft be eliminated?

Mr. BAKKE. No, sir, not to my knowledge.

Senator COTTON. This accident that we are now discussing didn't occasion such recommendations?

Mr. BAKKE. No, sir, it did not.

Senator COTTON. Thank you.

Mr. BAKKE. Mr. Chairman, we have from time to time been confronted with the question of the extent to which aviation intrudes upon the security of persons on the ground, third persons, so to speak. You may recall the recent accident involving a TWA 1049-H at Chicago, in which there were fatalities of persons in the vicinity of Chicago Midway Airport that again brought this question to the surface. We repeated a study that we had made on prior occasions when this question was raised, to get some better feel for the relationships between various modes of transportation so far as the effect upon the safety of third persons was concerned; and it is rather interesting that in a 10-year period, from 1950 through 1959, inclusive, that, not including the occupants of the vehicles involved, automobiles and taxis caused the death of 90,200 people. These are third persons, pedestrians and so on, not included in the vehicles, in that 10-year period. Railroads and passenger trains caused the death of 10,392 people. Busses caused the death of 4,345 people. But in that 10-year period, from all air carrier aircraft sources, we have the death of 26 people in that 10-year period.

Senator MONRONEY. May I say I hope the home developers don't get that set of statistics and use that to promote the sales of new subdivisions off the end of jet runways.

Senator COTTON. There have been quite a number of accidents in which planes have crashed into houses and into districts, military planes.

Mr. BAKKE. Sir, we don't have available to us those statistics. At least we did not at this study. I have no knowledge of the extent to which this might have been involved.

Senator MONRONEY. Many of those military accidents, as I recall, Senator Cotton, were planes falling far away from airport approaches. This is high performance aircraft going out of control, hitting a schoolyard and things of that kind, having little to do with the landing and taking off characteristics. But still, while we have been perhaps lucky, I don't think it is a factor that we can disregard. It is an ever-present hazard and we should try to preserve and clear the clear zones on all the major airports and all airports carrying high performance aircraft.

Mr. BAKKE. I would certainly agree with that, sir. My principal purpose in putting this forth was to demonstrate that even with problems such as those you described, aviation has had a remarkably good record in this respect.

Senator MONRONEY. I think at this point, General Quesada having arrived, if you will stand aside so that he can give his statement, we will get that into the record, and then we can resume the specific cases. I think we can say that we can excuse you until tomorrow morning at 10 o'clock, if that will be satisfactorily.

General Quesada, we appreciate having you here. We welcome a chance to hear your report. We commend you on the things that you have attempted to do during the first year of your operation under the new act.

We are happy to have your views and comments regarding the matters before this hearing. I presume you will make a general statement and then perhaps deal specifically with the particular question of air safety which is now the major object of this phase of our study.

Whatever you feel is preliminary to that, we will be delighted to hear. I think it will save time to have the general complete his statement and then we would ask him questions after he has finished.

STATEMENT OF E. R. QUESADA, ADMINISTRATOR OF THE FEDERAL AVIATION AGENCY; ACCOMPANIED BY JAMES T. PYLE, DEPUTY ADMINISTRATOR, FAA; DAGGETT H. HOWARD, GENERAL COUNSEL, FAA; BURLEIGH PUTNAM, BUREAU OF FLIGHT STANDARDS; AND DR. JAMES GODDARD, CIVIL AIR SURGEON, FEDERAL AVIATION AGENCY

Mr. QUESADA. Thank you, sir.

Senator, I have with me Mr. Daggett Howard, my legal counsel; Mr. Pyle, my deputy; Mr. Putnam, who is head of the Bureau of Flight Standards, and Dr. Goddard, who is a Civil Air Surgeon.

I am E. R. Quesada, Administrator of the Federal Aviation Agency. I wish to express my appreciation for the opportunity to appear before you and your committee to discuss the various air safety topics on which you have requested our comments. As you know, the Federal Aviation Agency is little more than one year old, and this is an appropriate time to report on the first year of our operations under the new act.

The purposes for which the Federal Aviation Agency was established are, of course, well known to this committee.

In creating the Federal Aviation Agency, Congress made clear its desire, among other things, to concentrate in a single independent agency, the authority and responsibility necessary to insure effective governmental services to, and regulation of, our Nation's civil and military flying activities.

The Federal Aviation Act of 1958 gathered together in the Federal Aviation Agency the scattered and diverse authority and functions which previously existed in separate departments, agencies, and interagency committees.

The major initial task we faced was, of course, the formation and staffing of an agency organization capable of effectively discharging our responsibilities under the new act. This had to be carried on without loss of momentum in providing existing services and performing functions of our predecessor agencies. In addition, the Federal Aviation Agency had acquired some functions which were either partially or entirely new, a principal example being management of airspace. Our safety regulation function had previously resided in the Civil Aeronautics Board. Operation of the air traffic control system derived from the Civil Aeronautics Administration. We inherited our research and development functions from the Airways Modernization Board. The new act also provided for direct military participation in the Agency's functions; and this innovation, too, had to be effected.

I have attached to my statement a copy of the organizational chart of the Federal Aviation Agency, which I think may be of interest to the committee. Without going into any great detail, the present organization of the Agency places program responsibilities in four principal bureaus—Flight Standards, Air Traffic Management, Facil-

ities and Materiel, and Research and Development. In addition, there are special operating responsibilities assigned to the Bureau of National Capital Airports and the Office of the Civil Air Surgeon. Our organizational philosophy is predicated on the principle of straight line functional responsibility. As an example, the director of the Bureau of Air Traffic Management, who is directly responsible to the Administrator, has direct line authority to his field activities. Likewise, medical functions flow in direct line authority from the Office of the Civil Air Surgeon to his field activities. In this manner, we are able to have specialized functions performed by specialists. Supporting our bureaus and performing essential functions in their own right, are Offices of Management Services, Personnel and Training, Plans and Requirements, and the General Counsel.

In staffing the Agency, we were fortunate in inheriting many capable people from our predecessor agencies. A number of others were obtained from outside the Government, or from other agencies and departments. I am convinced that we now have a well-staffed organization which can ably discharge the responsibilities Congress has given to us.

We have two major field installations. The new National Aviation Facilities Experimental Center in Atlantic City, N.J., is the proving ground for our research and development activities, and for the testing of new techniques, procedures, and equipment. It is making rapid progress toward completion. At this installation we conduct comprehensive engineering and operational tests, and evaluate systems, equipment, and procedures used, or intended for use, in the Nation's system of aviation facilities.

Our other major field organization is the Aeronautical Center in Oklahoma City. Rapid expansion of our personnel requirements and advances in aviation technology, have made it necessary to provide comprehensive professional training programs, both to train new employees and to keep existing employees abreast of the changes in technology. In addition, we are using our facilities there as the focal point for centralization of our logistics system. Challenging opportunities for significant savings and increased efficiency are being realized by expanding our activities in Oklahoma City, where we have 2,200 employees at the Aeronautical Center. We have increased employment in this area by approximately 350 in the past calendar year. This activity will continue to grow and will become even more important as we assume responsibility for the air traffic management activities of the Military Establishment.

I think we can point to a rather sound record of positive achievement on the part of the Federal Aviation Agency in the past year. Before I go into the details, I would like to discuss in a preliminary way, the accident data which has been the subject of extensive testimony by representatives of the CAB. I must say, very frankly, that the accident trend during the past years is a matter of great concern to me and the Agency. The only accident record we shall ever find acceptable is one that is accident-free. We say this with complete sincerity; and, in an attempt to increase the committee's understanding, we want it plainly understood that in on way do we shun or avoid one iota of our responsibility in pursuing the public's interest in flight safety.

If there is any single conclusion that stands out in an analysis of the data you have heard, aside from the increased rate and number of fatalities, it is that the type of accidents normally to be expected during this period, did not occur.

This was, of course, the first period for many years in which a revolutionary, high-performance transport type of aircraft wholly different from its predecessors in complexity and performance characteristics, was introduced into service as a major replacement for the existing fleet. Moreover, air traffic conditions were becoming ever more crowded; and for the first time civil jets commingled at high altitudes with the large population of military jets already there. We did not have a single passenger fatality during the year in scheduled passenger operation of turbojet aircraft. In addition, we did not have a passenger fatality from a midair collision in scheduled passenger service.

Although I am not the least bit happy with the overall safety data in question, I trust the committee will permit me the small satisfaction that we successfully played our part in meeting two of the most difficult problems confronting the Agency in its first year; namely, the safe introduction of the new jet transports and the problem of midair collisions, which, as you know, figured so prominently, early in 1958, as a major consideration for establishment of the Federal Aviation Agency.

We wish to assure the committee that, despite our concern over the statistics in question, we are not disheartened for the future. There are a number of things that we thought needed to be done when the Agency was first established. A great many of them have been done, and we are proceeding aggressively with others on a "first things first" basis.

Personally, I would like to have moved faster and farther in the first year; but there has been the ever-present, and always important, necessity of having full knowledge and understanding with respect to the problems and meeting the requirements of fairness, before imposing regulations in this highly technical field.

Although considerable regulatory action has been taken, it is unfortunately the case that the accidents experienced during 1959 necessarily occurred under safety standards and regulations little changed from those inherited from predecessor agencies. Our new or revised regulations obviously had little impact on safety in 1959. We feel, however, that they hold very definite promise for the future.

There is one further point we would like to bring out while we are on the subject of accidents. There are very valuable lessons to be learned from mistakes. The Federal Aviation Agency participates from the outset in all major accident investigations conducted by the Board. We have our own responsibility for determining the need for administrative action or enforcement of possible violations. Each process often makes possible the immediate adoption of corrective measures. You, of course, realize that we do not await the Board's official determination of probable cause, before giving application to the lessons we have learned. Thus, to take an example—although the Board has yet to render its decisions as to probable cause in 16 out of the 20 fatal air carrier accidents which took place last year, the Federal Aviation Agency has already taken numerous steps to correct

deficiencies in this area which became apparent in the investigative stage.

The Board's reports, in which the probable cause of accidents is determined, provide valuable information essential and helpful to our own preventive measures. I am most grateful to the Board for the thoroughness of their reports. Their task is difficult; it is performed with skill, and we find the Board most helpful in the fulfillment of our own responsibilities. Those who may be critical of the time consumed in determining probable cause are unaware of the difficulties of the task. I am very grateful for Mr. Durfee's clear understanding of this specific problem.

We should also bear firmly in mind, particularly with respect to a regulation such as the 60-year airline pilot age limit, which I will discuss in greater detail in a subsequent hearing, that accidents are not necessarily the sole, or even the most helpful, source of information and data for the formulation of certain necessary safety rules. I know that the Congress expects, the public deserves, and we intend to provide, something more than an agency which is merely responsive to disaster. We must develop and maintain the wisdom, foresight and decisiveness, and the moral courage necessary to eliminate hazards before they result in tragic loss of life and human misery. I know that the Congress, and the public, want and expect our Agency to be one, which keeps alert and abreast of the times, and not one which merely picks up the pieces after the event.

During this past year, the Agency's aviation safety activities have consisted essentially of three phases; First, providing adequate regulations; second, administering these regulations and applying them to the activities of the various segments of aviation; and third, conducting inspections for compliance and carrying out an enforcement program.

For the first time in almost 20 years there has been an opportunity to establish a unified safety regulation program. Although we wish we could have taken even greater advantage of this opportunity, we believe we did have a sound record of positive accomplishment during the past year.

In the regulations area, the Agency inherited an existing set of safety regulations from the Civil Aeronautics Board and the Civil Aeronautics Administration. These regulations in many respects were adequate, and in others they were not. We have already moved decisively in adopting a number of important amendments. Our present evaluation of the regulations indicates that many other changes and improvements remain to be made. One of the basic defects of the present system is that it reflects the divided authority that previously existed. Ultimately, the entire regulatory structure must be recodified and simplified to make it more orderly and readily understood, as well as more compatible with the present responsibility of the Federal Aviation Agency. While we recognize this need we view it as a long-range project, subordinate to the immediate safety needs, which we are pursuing on a priority basis.

I would like to mention some of the most important regulatory steps we have taken during our first year.

(1) Air carrier flight crew training programs have been required to be submitted to the Agency for our approval.

(2) Qualification requirements have been raised for copilots serving on air carrier aircraft, and periodic checks of their proficiency are similar in many respects to those required for pilots-in-command.

(3) Improved and modernized medical standards for airman certification have been adopted.

(4) Upper age limitation of 60 years has been established for pilots serving in air carrier transportation.

(5) The skill and experience standards for certification of private and commercial pilots have been raised.

(6) Air carriers have been required to have airborne radar installed in transport category aircraft for weather surveillance purposes.

(7) Reasonable limitations have been imposed on the consumption of alcoholic beverages by passengers on air carrier flights.

As I indicated earlier, I would very much prefer to have moved faster and farther in many additional areas; but I hardly need tell you that this is a point of view which is clearly not shared by some of the special aviation interests. There is a great tendency, when there are accidents of the kind we all deplore, for certain aviation interests to say, in effect, "Do something and do it quickly, but don't do it to me."

Although I am sure this is an old story in the personal experience of the members of this committee, this might well be a good time to speak generally on the problem of pressures from special interest groups who feel that no regulation should be adopted unless it is completely satisfactory to them. The formation of associations, councils, boards, et cetera, by groups of citizens banding together to serve their own special interests, is a well recognized element in our American system. May I be permitted to place this type of activity in its proper context.

Under the Federal Aviation Act of 1958, you have made the Agency responsible for serving the "public interest." My concept of the public I serve includes the many millions of people who stay on the ground and merely wish protection from aircraft. It includes the 50 to 60 millions of people who travel by air. It also includes what might be termed "the aviation community." This is composed of the owners, operators, and builders of aircraft and aviation facilities and products, private pilots, ground personnel, crew members, and many other special interest aviation groups.

I want to make it ultra clear at the outset that I have great admiration for the many fine individuals who comprise the aviation community. Some of the finest people I know are in aviation. They have worked long and hard, and have given of themselves, in the unending fight for aviation progress. As a nation we should be grateful to these many dedicated persons for the position aviation has attained. Similarly, the associations and organizations representing segments of the industry have in the past and will in the future, contribute, as groups, to our progress. I, for one, recognize that without the sincere and valuable cooperation of these many dedicated individuals and groups, the task confronting the Federal Aviation Agency would be impossible.

By the very nature of things, however, the special interests of many of these groups are often in conflict with each other. More importantly, they are often in conflict with the "public interest." Our job,

then, often becomes one of balancing the equities among these groups and the great body of the general public, which, incidentally, seldom has a vocal supporter. The public is traditionally silent and most often look to Congress and the bodies it creates to pursue their interests.

Whatever action we take, one or more special interest groups are likely to find themselves thwarted in their parochial desires.

Thus, it is understandable that decisive action on the part of the Agency often is met with opposition from the groups whose interests appear to them to be adversely affected.

These special interest groups are represented by a number of associations and organizations which have actively dealt with the Agency over the past year, and with its predecessor agencies for many years previously. I know you are familiar with many of them, because they are in many instances registered lobbyists or have individuals representing them in that capacity. That is why you know them. There are no less than 40 of these groups.

Many such groups can, and frequently do, play a constructive part in the Agency's rulemaking actions; and whether or not they are helpful, we clearly recognize their right to express their views and have them duly considered.

During this past year, the spokesmen for a few of these special interest groups have at times employed pure invective and intemperate attack in what I can only regard as an effort to intimidate the Agency and obstruct our sincere efforts to serve the public.

Let me say here and now that I refuse to yield to this pressure, that I refuse to be intimidated, and that those who resort to such tactics are not only doing a disservice to their membership but also fail to serve the legitimate aims of their organization. I express this last thought not because of any bitterness toward the fine persons composing their membership, but because of the simple fact that such tactics are destroyers of trust and confidence. At some point it becomes impossible to distinguish distortions from sincere criticisms. The purveyors of distortions cease to be effective advocates.

Unfortunately, in my opinion, most of us have come to be somewhat resigned to irresponsible tactics and contrived efforts to exert pressure. There is, of course, a degree of poetic license permitted in fighting for one's position. But where the lives of the public are at stake we must have the courage and conviction to draw the line against all extremes of irresponsibility. Nothing less is expected from the Agency I head. Despite these instances of excesses, we shall continue to welcome and give due consideration to all views.

Perhaps there are some areas where it is possible to relax and assume that words of invective and unjustified attack would not really hurt anybody. But I would like to show the committee the precise reasons why this is not so, when we are dealing with aviation safety. I have already said that I will not be intimidated. I hope I can say the same for our dedicated people who are daily serving as guardians of public safety. But I think you will agree that it would be too much to expect that some of our Agency personnel will not be in some measure influenced by this form of intimidation and pressure. I assure the committee that I am doing everything in my power to insure that my successor, whoever he may be, will find our Agency personnel with the

courage and determination to continue to withstand pressures of this kind.

Another insidious effect of this form of activity is that it instills a false sense of grievance in the minds of many fine pilots and airmen engaged in the exacting technique of air operations. The disruption this can cause is not subject to precise calculation, but it can do untold damage to the cause of public safety. At first, you may not take this matter very seriously. I would like to give you just a few examples of laxness, complacency and even defiance. All these cases involved scheduled airline passenger-carrying flights.

1. An authorized FAA inspector presented his credentials, was refused admission to the cockpit by an airline captain and was, therefore, unable to continue his en route inspection.

2. An airline captain who assumed the posture of sleep, with his feet on the radar set, for a period of 30 minutes while an inspector was in the cockpit riding an en route inspection. This could hardly be a demonstration of being harassed.

3. A fatal accident—15 lives lost—in which we found the captain had not taken the required medical examination for 3½ years, was 2 months overdue on the required proficiency check and was therefore legally unqualified to fly. The company records for which he was responsible were falsified to conceal these facts.

4. An airline crew which was observed by an FAA inspector to fail to use the checklist during the entire flight. When questioned after the flight by the inspector as to why he failed to use the checklist, the captain replied to this effect, "I don't use it when you are not on board; why should I use it when you are?"

The importance of this may pass your observation. I would like to remind the committee that on two occasions, in the year 1959, two aircraft-carrying passengers for hire in passenger service landed with their wheels up, primarily and obviously because they failed to use the checklist which is required by the rules.

I would be glad to give the committee a photograph of a cockpit of a current and modern aircraft as an indication of what it looks like.

As we have taken action to prevent and correct situations of this kind, our efforts to protect the traveling public have been discredited by distortions and irresponsible assertions. The effect of these has been to create a false sense of grievance in the minds of many pilots.

I cite the foregoing simply as examples, both to show the damage that can be done to the attitude of those who actually do the flying and to show that there is a very real need for regulation. I do not cite these cases to impugn in any way the great majority of those sincere, qualified and talented individuals whose efforts have given us world leadership in aviation.

I might say here that the many who pursue safe practices are just as concerned as we are with the actions of those who do not. There is a saying familiar to all of us in aviation which I would like to quote.

"Aviation in itself is not inherently dangerous, but even more than the sea, it is terribly unforgiving of any carelessness, neglect or incompetence."

The aviation community cannot tolerate any carelessness, neglect or incompetence in any phase of aviation affecting public safety.

I would like now to turn to the matter of the fairness of the Agency's actions. A few special interest groups, when confronted with a rule they do not like, even though unable to challange it on its merits, often resort to charges that it was adopted by arbitrary and unreasonable procedures.

I would like to submit for the record two articles from a publication of one of these pressure groups. One is entitled "Dictatorship?", and the other is entitled "Arbitrary and Capricious." They appear in the magazines that I now hand over to the recorder.

(Publications follow:)

[Editorial from the AOPA Pilot, December 1959]

DICTATORSHIP?

We've had just about a year of the FAA now. Because it so closely affects everything about our flying, we've watched it with care, sometimes with concern, sometimes with approval. One thing is certainly true: the FAA is a lot different from the old CAA, or any of its predecessors. It's aggressive, tough, forthright, fast-acting, and—above all—virtually the mirror of its administrator, "Pete" Quesada. It's also well on its way to becoming one of the biggest Government bureaus in the history of the country.

AOPA has praised Quesada and the FFA on a number of occasions. We've criticized them on others. Now that we have a year's work behind us we think we can look at the FAA fairly objectively, and reflect on the overall results.

From a broad, overall point of view, we don't like much of what we've seen. We like even less what we think we can see ahead. Because it's quite clear now that civil aviation is in the hands of a dictatorship This is not to say that Mr. Quesada is a Hitler; far from it. He's one of the nicest guys you'd want to know, as are most of his people. He's been helpful, considerate, and we've yet to find that he "speaks with a forked tongue," as the Indians put it.

It's the basic law which makes FAA the dictatorship it actually is. It's not the fault of Quesada & Co. that they have almost unlimited authority to do what they please, virtually without question. It is the fault of the Federal Aviation Act—specifically, the Members of Congress who slid this act into being while giving the impression they were somehow saving the civilized world from absolute and total destruction.

We see now, a year later, that civil aviation must have an absolutely independent source of appeal from arbitrary or capricous acts of FAA officials. We saw it a year ago, but foolishly let ourselves get talked out of it in a general aviation meeting—as did every other major civil aviation organization except one: the Flying Farmers. Their president held out to the bitter end, and we're ashamed to say that we encouraged him to go along with the majority and stop insisting on a source of appeal from the acts of the FFA, a source something like the CAB used to be when we had the CAA.

Looking back on this year, we feel that this lack of unbiased appeal is the greatest single need. We now have many instances on the record in which FAA officials have acted arbitrarily and with frequent disregard for the facts. In airspace matters they tell all and sundry that they and they alone can and will make decisions for us all, and all of us have been fighting for the past year just to get their permission to sit in a room (as we used to do once a week) and discuss airspace problems, all of which are of daily and pressing concern to all users of the airspace.

Most glaring of this year's case histories to AOPA, of course, is the arbitrary manner in which the FAA has railroaded into being the new medical rules. They didn't care a damn what anyone else thought, they said so frankly, and ordered the new rules into being with hardly a shred of factual evidence to support their actions—another fact which they candidly admit.

FAA officials insist, of course, that we do have constitutional safeguards. One of these they talk about so much is called the Administrative Procedures Act, which requires all Government agencies to give the people affected by their acts a chance to be heard. The FAA complies with this. Once you've been heard they ignore you—but they've complied with the law. Only other recourse is the Federal courts. Best legal advice AOPA can get is that this is a hope-

less business, from a practical point of view. The courts, we're told, will merely see to it that the FAA abides by the law. They will not challenge, for example, the position of the newly created Civil Air Surgeon on heart conditions, diabetes, or nervous disorders. Under the old CAA, civil aviation did have an appeal, and the CAB invariably overruled CAA officials when it appeared they were being arbitrary and capricious. The CAB was staffed with aviation people competent to judge, something the courts cannot do.

As we see it, this lack of practical safeguards makes the FAA a dangerous dictatorship. Mr. Quesada is friendly and understanding. But the next man may not be, and the abuses could treble overnight. Granted, the old democratic processes do slow things down, while affected people discuss and debate. But that's the principle on which our country was founded, and neither the FAA, nor any other branch of the Government which is supposed to be serving the people, has any business changing that. That's why AOPA has joined with the Air Line Pilots Association in objecting to the arbitrary manner in which the FAA has said it intends to ground airline pilots after age 60. The special problems of airline pilots do not concern us—but arbitrary rulings, and the refusal to substantiate such rulings publicly and with facts, do concern AOPA.

Fundamental changes in the Federal Aviation Act are needed. The FAA is not omniscient. It must be held accountable to the people it serves, and the law of the land must assure this. As Thomas Jefferson said: "When a man assumes a public trust, he should consider himself as public property."

[Editorial from the AOPA Pilot, January 1960]

ARBITRARY AND CAPRICIOUS

The FAA has decreed, in an atmosphere of virtual omniscience, that airline pilots are to be grounded automatically at age 60, effective in March. Thus has Mr. Quesada & Co. added one more case history of arbitrariness and capriciousness to the FAA's already dismal record.

If the fate of a handful of airline pilots seems little cause for concern to the average AOPA member, one need only to think for a short moment to see how serious such arbitrary FAA action really is to all in civil aviation, not just to a small minority of older men flying the airlines.

The public record—which FAA itself quite candidly helps fill—makes it abundantly clear that the Government has no factual evidence or justification for this act. They say so in their public announcement, presumably a stroke of public relations acumen that's supposed to take the wind out of the sails of anyone pointing to this obvious fact in amazement. This is precisely what they did not long ago when the FAA—again, arbitrarily and capriciously—ordered important changes in the medical requirements governing the vast majority of all civil pilots.

In the case of the airline pilots, the FAA pronouncement blandly says they're taking this step "in the interest of safety," the aeronautical equivalent of "we're against sin and for motherhood." Even more unfortunately, there's an articulate segment of the uninformed press that leaps on that bandwagon of platitudes, just as if the FAA has, at long last and after much effort, taken a step that will have a sweeping effect on the safety record of the airlines.

In reality, all this is pure bureaucratic fakery, the very sort of thing that makes it imperative that the Federal Aviation Act be overhauled as quickly as possible for the good of civil aviation. As a matter of fact, 1959, the first full year of the FAA's existence, has proved to be the worst airline-accident year in history.

AOPA supports the Air Line Pilots Association in their fight against this sort of bureaucracy, because of the principle involved. If the FAA can be this arbitrary and capricious with airline pilots, and get away with it, then anyone and everyone in civil aviation is fair game, for whatever fancied notion happens to cross the minds of some FAA officials. Pilots with blue eyes are in danger, as are pilots with runny noses, fallen arches, pot bellies, or those who voted the wrong political ticket.

While this is AOJA's basic reason for joining with ALPA, the facts in this particular case also are of interest, because we had to check them to make sure that the FAA was being as highhanded as we suspected. We did our checking quickly and easily on the phone. First, we had the FAA's own word for it

that they don't have supporting evidence to substantiate their case. Then we checked with the Civil Aeronautics Board, which keeps detailed and elaborate records on all airline accidents. Their records indicate that, between 1951 and 1958 they have analyzed 132 airline accidents in which the pilots were found to be a causal factor. Three accidents in these 7 years involved pilots in the 50–59 age group. But not one of these was attributable to physical incapacitation.

So we checked in other public-carrier fields. The Interstate Commerce Commission, which has jurisdiction over all interstate operations of railroads, commercial buses and trucks, has no maximum age limit, and they only require a physical exam every 3 years (airline pilots must take them every 6 months). Some bus and trucking companies have more stringent rules of their own (such as an annual physical), but the Government does not. The U.S. Maritime Commission told AOPA they not only don't have such a maximum age limit, but they recently found in a survey that fully 34 percent of all deck officers, engineers, and radio officers certificated by the Government are over 50 years of age. Our informant knew of one engineer still active on a public-carrying vessel who's 79. Ship captains themselves are very likely to be in their 60's. Even so, all the Government requires is that they renew their master's certificates every 5 years—the physical requirements, incidentally, being confined to a test for color vision. The bus companies themselves use quite a number of drivers in the 50–60 bracket, and keep right on using them so long as they meet the requirements. Most bus drivers retire voluntarily because of attractive company pension plans. The same is true of the railroads.

It can hardly be said that locomotive engineers, bus drivers, and steamship captains do not have the same responsibilities as the airline pilot. Obviously, they do—and with many times greater numbers of the traveling public than the airlines will carry for many years to come.

AOPA learned this wtih a few brief phone calls. The FAA could at least have done that, had they been concerned with acting like public servants. Instead, they have once again acted without regard for the consequences of their caprice. This latest evidence of their callous indifference to their responsibilities to foster and promote civil aviation has served to bring together all the usually diverse elements of civil aviation behind one goal: put a stop to this high-handedness, fix the Federal Aviation Act to assure that the "Federal aviation autocracy" assumes the role originally intended for it.

Mr. QUESADA. As this committee well knows, the procedures for rulemaking are, for the most part, set forth in the Administrative Procedure Act, which was adopted by the Congress nearly 14 years ago and has stood as a landmark of fairness and due process, virtually without amendment since that time. It applies to nearly all rulemaking activity of the Government, particularly that affecting aviation and all other federally regulated industries and business activities. We have followed these procedures faithfully. I defy anyone to show a single instance where this was not true in the issuance of safety rules by the Federal Aviation Agency.

Our prescribed procedure insures the opportunity required under that act to all interested persons to comment on a proposed rule prior to issuance, after reasonable notice as to the nature of the proposal. Once the comments and positions are all in, we have carefully weighed and evaluated them. We have then issued the rule which we thought necessary in the public interest to discharge the safety responsibilities given us by the Congress.

Actually, rulemaking is, of course, an extension in technical and specialized areas of the legislative role of Congress; and no formal evidentiary hearing is required any more than such is required in legislative activities of the Congress. This rulemaking procedure looks toward adoption of a "quasi-legislative" standard, rather than the application of that standard to the facts of a particular case. When the

standard is applied to the facts of a particular case, we have something akin to a judicial proceeding; and an evidentiary hearing is a normal requirement of due process before a final decision can be made.

The rulemaking procedures I have just described are designed to insure that the Agency is fully informed before it acts, so that it will be able to take wise and informed regulatory action. I do not wish to leave the impression that the Agency is not disposed to grant hearings. We have in fact granted such opportunities in the past, and will continue to do so in the future. Our policy in the grant or denial of the opportunity for oral presentation is as follows:

As previously stated all interested persons are requested to make written comments on a proposed rule. If they wish to supplement their written views with an oral presentation, they may make a formal request for such an opportunity in writing and must provide justification showing the purpose to be served. It is our policy to grant a hearing when:

(1) Oral presentation is necessary to explain or illustrate their views in such detail that written presentation is impractical or insufficient;

(2) New evidence or new arguments have come to light which were previously unavailable and it is more expeditious to consider them orally, or

(3) Any other reasonable showing is made. We may, of course, call a hearing on our own initiative when we believe it improves the Agency's ability to determine the question involved.

It is important to keep in mind that fairness is a matter of fairness to the public as well as to the individual concerned. When a party's request for a hearing has the effect of delaying the adoption of a safety measure for the protection of the public, it seems a small inconvenience to require him to demonstrate the purpose that would be served by a hearing.

I am sure the committee will be particularly interested in one innovation we have adopted. We have sought to protect the integrity of our rulemaking procedures from ex parte influence of the kind which has recently received so much adverse publicity in the conduct of affairs in other regulatory commissions and agencies. Prior to the formal institution of a rulemaking proceeding by issuance of a notice, we feel free to consult experts of all kinds, including the special interest groups I have referred to, to obtain assistance in developing our own initial views. However, once formal proceedings are commenced by issuance of a notice of proposed rulemaking, all arguments or factual data presented by interested persons, which we consider in the final adoption of the rule, are a matter of record, contained in a public docket.

This does not mean that all parties are foreclosed from submitting views to us after the period for written comments is closed. It does mean that any conference or consultation with us by an interested person is duly recorded and placed in the public docket, and that the views expressed must bear the light of public scrutiny. In addition, we have followed, in the interest of fairness, the practice of notifying parties who have opposing views, when we hold a conference of this

kind and giving them an opportunity to have a similar conference with us.

I am sure the committee shares my view that the integrity of the official actions of this Agency must be preserved, and I hope that you consider the policy I have just outlined a wise one.

Some of the charges of unfairness, made by a few special interest groups, amount to saying that they were not "at all times fully informed of what the Agency was doing." Again I might repeat that fairness is a matter of fairness to the public as well as fairness to the individual. All groups have had the same notice and the same rights, and the procedures followed have been completely within the letter and spirit of the law and the dictates of due process. No special interest group can be permitted to hold the pen that writes the rule.

So much for the issuance of safety rules. I would like now to move on to consideration of the second phase of our aviation safety program, the administration and surveillance part of our work. A regulation, once adopted, must be administered. This means such multiple and varied tasks as giving examinations to airmen, conducting flight inspections of air carrier operations, checking the maintenance of air carriers, monitoring training programs and, in general, overseeing the manner in which the safety regulations are actually operating.

We have just completed a concentrated 30-day inspection program of air carrier operations. This inspection program was conducted on a 7-day, around-the-clock basis. The purpose was threefold: One, to detect any "soft spots" in individual flight crew members by personal observation; two, to determine the overall adequacy of airline training programs, operating manuals, and company procedures; three, to initiate immediate corrective action when requirements of the "Civil Air Regulations" are not being met.

We have also during this past year completed several intensive special investigations of individual air carrier maintenance programs, going far beyond our normal maintenance inspection programs, to make a full determination of the extent to which they comply, or fail to comply, with the maintenance regulations. In one instance, our findings with respect to a major carrier, and our subsequent discussions with that carrier, resulted in a reorganization of the company's maintenance activities. We are at the present time discussing with another major carrier deficiencies which we have found in its method of operation and maintenance.

We have made similar surveys of the training programs being carried out by a number of air carriers to qualify flight engineers for assignment as a member of flight crews. Based upon this, we have developed a completely revised part of the regulations governing issuance of certificates to flight engineers. This will shortly be issued as a notice of proposed rulemaking. The regulations have already been amended to require specific approval of training programs carried out by the air carriers, of all flight crew members, and a standard to be applied in approving or rejecting these training programs is in the process of preparation.

We are also developing a completely revised part of the regulations governing the issuance of mechanic certificates, in an effort to bring the requirements in this area into line with the responsibilities re-

sulting from the increased complexity and difficulty of maintaining turbine-powered aircraft.

In addition, we are also making rapid progress in developing the necessary technical data to carry out, with greater preciseness, the provisions of section 601 of the act for rules, regulations, and minimum standards governing (*a*) the inspection, servicing and overhaul of aircraft; (*b*) the equipment and facilities used for this purpose; and (*c*) the periods for and the manner in which such inspection, servicing, and overhaul shall be made.

Since we feel that better control of the quality of airmen can be achieved by having more examinations conducted by our own inspectors, we are reducing the utilization of non-FAA examiners to the absolute minimum, compatible with our improving capability.

A major part of our administrative activities is concerned with airworthiness of aircraft. This is intimately connected with the regulatory phase of our program, and is directed to assuring that the equipment used meets airworthiness standards. As a result of information gathered through this activity, changes to the airworthiness regulations are constantly under consideration. Early in 1960, meetings will be held with aircraft manufacturers, air carriers, and other interested groups to consider a number of specific changes to the airworthiness regulations.

Business flying and air taxi operations have also, during the past year, received increasing attention. Business flying during 1959 continued its phenomenal rate of growth. Hours flown in business use have more than doubled over the past 10 years, increasing from 2,615,000 in 1949 to an estimated 5,700,000 in 1959. There are currently more than 1,200 large transport type aircraft in the business fleet, including the newer turboprop airplanes. This number is expected to increase to at least 1,500 by 1961, and will include pure jet aircraft. In line with this increased activity, a 60-day special-emphasis surveillance campaign was conducted during July and August 1959 covering all aspects of business flight operations.

Major revisions to the regulations which govern air taxi operators are being considered. We intend to adopt more realistic requirements for this type of operation. In addition, we are contemplating provisions for more frequent inspection and surveillance of air taxi operations.

Future plans and programs are expected to provide for expansion of the regular inspections of air taxi operations and the training of a sufficient number of additional FAA business flying specialists on large multiengine piston and turbine-powered executive aircraft, in order that they may more adequately supervise business flying operations utilizing such aircraft.

Other major aspects of general aviation safety received careful attention this past year. A major amendment to part 20 provided for some instrument training to improve the aeronautical knowledge, skill, and competence of student, private and commercial pilots. This important change should result in a decrease in the number of serious and fatal accidents in these categories, especially those which result from inability to cope with inflight emergencies and loss of control under instrument conditions. This training will provide an emergency capability for pilots who become inadvertently involved in poor visibility or weather conditions.

During 1958, private pilots were involved in a total of 272 major accidents in which 345 pilots and passengers were killed and 155 seriously injured. Of these accidents, 120— or 44 percent—resulted from inability to cope with emergencies which developed primarily en route, such as becoming lost, loss of control in instrument conditions, and collision with objects in reduced visibility.

Before going into the details of our enforcement activities during the past year, I think it might be well to bring sharply into focus just what we mean by enforcement. Enforcement is the tool or means by which we command respect for and adherence to our safety standards and rules. But this tool must be used fairly and wisely. Equal justice under the law has a prominent place in our enforcement policies.

It is only the minority who do not comply with safety regulations. The great majority do comply. A policy of weak enforcement, with favoritism to the irresponsible few who complain the loudest, would quickly undermine compliance by the responsible majority. A policy of firm and fair enforcement without favoritism strengthens the normal inclination of the great majority who give their voluntary cooperation and adherence.

The efforts of some pressure groups, when one of their members is involved, might lead one to believe that the great majority of their members have no stake in our obtaining compliance. As a pilot for over 30 years, I assure you that nothing could be farther from the truth. Flying is not safe unless each pilot can be assured that other pilots are conducting their flights in accordance with the established regulations. Those who complain loudest when legitimate enforcement action is taken against them, would be the first to complain if such enforcement action was not being taken against pilots other than themselves.

In our initial appraisal of aviation safety, we found that there was a disturbing indifference or laxness in two distinct areas. These were pilot and cockpit discipline, and aircraft maintenance. Accordingly, the emphasis of our efforts has been toward correcting these deficiencies as rapidly as possible. Our concentrated surveillance and inspection and our continued monitoring of all types of operations have been geared to bring to light violations in these areas.

As you probably know, the civil air regulations place responsibility for the safety of the flight, its crew, passengers and cargo, during flight, upon the pilot in command. The Federal Aviation Act itself charges the air carrier with the duty to conduct its operations with the highest possible degree of safety. The regulatory program I have already mentioned, to improve pilot training, to modernize medical standards, to limit the upper age of air carrier pilots, and to raise the qualification requirements for copilots, has been responsive to this special concern of Congress for the safety of the air carrier passenger. I might add that I very deeply share this same concern.

We must recognize, however, that there comes an end to the training which can be required of an air carrier pilot before he takes over command of a flight. Once he is assigned to a passenger-carrying flight, the safety of it is largely in his hands. At this point discipline becomes all important. In today's modern aircraft he must be proficient, vigilant, and constantly attentive to this duties.

It is no secret, and indeed we have made it widely known, that the Federal Aviation Agency intends to do everything in its power to obtain pilot and cockpit discipline. The civil jet transport, while a wonderful aircraft, is very unforgiving of mistakes or failures on the part of its crew, a fact which serves to emphasize the importance of our program.

The shocking incident involving a 707 jet transport with 119 passenger aboard, over the North Atlantic early in February 1959, is a notable example of the reasons for our concern in this regard. I am sure by this time the facts are well known, but I would like to refresh your memory.

In this instance, the aircraft was cruising normally and in darkness at 31,000 feet over the North Atlantic. The automatic pilot disengaged, and the aircraft proceeded unattended into a descent. As speed increased, the aircraft dropped its right wing, rolled on its back, and went into a vertical dive. Its speed approached that of sound. When the aircraft was finally pulled out of this uncontrolled position at 6,000 feet it was subjected to G forces which exceeded the design limits of the aircraft by a wide margin. The aircraft sustained major structural damage and narrowly escaped complete structural failure.

Although the autopilot had malfunctioned twice before on the previous eastward passage of this airplane and once on the Paris-to-London leg of this same westbound flight, the warning light to indicate its disengagement went unnoticed because the captain's seat was empty—the captain's seat was empty. Upon investigation, we found that the pilot in command was in the passenger cabin at the time for reasons not necessary to his normal duties. The copilot who was in his own seat was preoccupied with other activities and was not paying attention to the instruments.

Further investigation also disclosed that the company responsible for the safety of the flight had negligently failed to install tape in the flight recorder—the very instrument designed to record events of this kind. After thoroughly investigating, we took enforcement action immediately, consisting of a $1,000 civil penalty against the pilot in command, $1,000 civil penalty against the company, and a 90-day suspension of the copilot's certificate.

Comparable instances of laxness and inattention to fundamentals have been observed through our increased surveillance and inspection of air carrier maintenance. Violations have been reported showing that certain carriers on occasion have released aircraft for operations without required equipment or with the installed equipment not operative. Aircraft have sometimes been released from maintenance in an unairworthy condition due to the failure to install necessary parts, or because maintenance was performed in an improper manner. We have taken firm enforcement action on these incidents. Our efforts in this area shall be continued, to assure that air carriers fulfill their responsibility to the traveling public to perform their services with the highest possible degree fo safety.

Our inspection of all types of operations—general and air carrier—has resulted in the filing of 3,884 violation reports during the calendar year 1959, an increase of almost 100 percent over the number of violation reports filed during the fiscal year 1958. We have taken

enforcement action in regard to 2,902 of these reports. In order to put this matter in proper perspective, there are over a million outstanding certificates of all kinds which are subject to our enforcement responsibility.

As you know, the Federal Aviation Act places full responsibility in the military services for taking disciplinary measures against their military personnel to assure compliance with the civil air regulations. During 1959 FAA forwarded 65 complaints against military airmen to the services for disciplinary or corrective action. A full compilation of our enforcement actions is being submitted for the record.

(The compilation follows:)

Washington enforcement, 1959

Cases on hand Jan. 1, 1950	61
Violation reports received in 1959	732
Total	793
Less: Cases transferred to regions or elsewhere	25
Total cases in Washington	768
Actions taken:	
Civil penalties	112
Certificate actions	30
Referred to military	65
Reprimands	32
Filed, no action	152
Total actions taken	391
Total cases on hand, no initial action	377

Analysis of actions taken, 1959

Civil penalties:	
Referred to Department of Justice	11
Awaiting reply from violator	27
Payment received and closed	74
Total	112
Certificate actions:	
Appeals pending, CAB	3
Appeals pending U.S. court of appeals	1
Awaiting reply from violator	9
Closed	17
Total	30
Military:	
Awaiting reply from military	21
Replies received and closed	44
Total	65

Analysis of violation reports received, 1959

Military	202
Air carrier	156
Air carrier personnel	374
Total	732

Washington, enforcement, 1959

Month	Civil penalties	Certificate	Reprimand	Referred to the military	Filed for record	Total	Violations received
January	1	1				2	4
February	3	2	4		1	10	7
March	1				3	4	25
April	5	4	6		2	17	38
May		3	1	3	2	9	84
June	17	1	1	2	13	34	78
July	15	3	2	18	21	59	54
August	12	3	3	18	9	45	84
September	11	3	5	11	24	54	75
October	12	2	4	2	14	34	122
November	23	3	2	6	44	78	96
December	12	5	4	5	19	45	62
Total	112	30	32	65	152	391	732

Consolidated report, 1959—Washington and regions

Violation reports received	3,884
Actions taken:	
Civil penalties	1,093
Certificate action	948
Reprimands	861
Referred to military	65
Filed, no action	280
Total actions taken	3,247
Cases on hand	637

Regions, enforcement, 1959

Month	Penalties	Certificate	Reprimand	Filed without action	Total	Violations received
January	82	54	71	7	214	208
February	80	24	79	6	189	185
March	58	73	61	5	197	247
April	49	88	52	7	196	270
May	102	79	70	7	258	256
June	62	80	74	7	223	312
July	100	82	81	11	274	249
August	62	87	82	23	254	268
September	76	96	50	17	239	330
October	65	87	73	5	230	309
November	78	84	79	15	256	256
December	67	84	57	18	226	226
Total	881	918	829	128	2,756	3,116

Analysis of actions taken

Air carrier pilots:		
Violations received		235
Certificate actions [1]	30	
Civil penalties	56	
Reprimands	28	
		114
Total		121
Closed—no action		64
Cases on hand		57
Military pilots:		
Violations received		202
Forwarded to military		65
Total		137
Closed—no action		47
Cases on hand		90

[1] 4 appeals to CAB filed.

Mr. QUESADA. The committee will recall that, under the Federal Aviation Act of 1958, the Agency was given authority to suspend or revoke all types of certificates issued by it, with the right of appeal to the Civil Aeronautics Board and the U.S. court of appeals. In 1959, the Federal Aviation Agency issued 948 orders suspending or revoking certificates. Of these, only 51, or approximately 5 percent, have been appealed to the CAB. We believe that the small number of appeals confirms the wisdom of Congress in placing the authority to issue such orders in the hands of the Federal Aviation Agency.

The significance of this can be further appreciated by comparing the processes that would have been necessary under the Civil Aeronautics Act of 1938 to obtain the same result. When our predecessor agency in the enforcement function, the Civil Aeronautics Administration, found that certificate action was necessary, it could only file a complaint with the CAB. Thus, to achieve the same effect toward compliance with safety standards, the former CAA Administrator would have had to file 948 complaints with the CAB. The CAB would have had to consider each case in its entirety on the evidence submitted after notice and hearing or, if a hearing were waived, on the basis of documentary evidence. The delays and expense incurred in such a procedure, both for the litigant and for the Government, were well known to the Congress and were a motivating force in establishing the new procedure under the Federal Aviation Agency.

Today, the individual is given notice of our intention to take action; he can be heard informally and can submit whatever he chooses prior to the issuance of an order, with a minimum of time and expense on his part. If he is dissatisfied with the order, he can then appeal to the Board and have a full-dress hearing. I assure you that the new procedure has been notably successful, and provides effective enforcement speedily, with justice and fairness to the persons involved. In addition, it has provided fairness to the individual at a minimum of cost to him in time and money.

In addition to our authority to suspend or revoke certificates, we have the alternative of issuing civil penalties in an amount not to exceed $1,000 for each violation. We do not have authority to finally

impose such a penalty. If the alleged offender does not agree to it, we must refer the matter to the Department of Justice for court action. We have issued civil penalties in the calendar year 1959 in 1,093 cases. Civil penalties against air carriers amounted to approximately 10 percent of the total number issued.

I can assure the committee that we intend to continue to carry on a vigorous enforcement program, despite whatever pressures might be exerted from those individuals or groups in the industry who without factual information have complained so loudly. We recognize that no popularity contests will be won by such a program. However, our responsibilities to assure the safe transportation of the public require that we enforce the law to the best of our ability.

Now, to sum up the aviation safety picture as we see it, I might return briefly to the accident record of 1959 and some of the key measures we have taken during that same period which hold promise for correction of the deficiencies involved. We shall continue to develop further corrective measures in the months and years ahead. I sincerely hope that some of the irresponsible attackers I have referred to will take the lessons of these accidents to heart, abandon their policy of selfishly motivated obstruction, and join forces with us in doing this urgent task, which we are well aware we cannot do alone.

As I indicated earlier, although the Civil Aeronautics Board is responsible for the investigation of accidents and determination of the probable cause, we participate very actively in the investigations and often take corrective measures long before the official decision on probable cause can be issued. Without passing judgment on any individual accidents, I might say that we have analyzed all air carrier accidents during the past year as an aid to the effective discharge of our safety responsibilities.

Of the 136 accidents we studied, our analysis indicates approximately 50 percent can be attributed to error or failure on the part of the flight crew. Slightly less than 25 percent are attributable to faulty maintenance of the aircraft by ground personnel. Approximately 18 percent resulted from failure during operation of some part of the aircraft itself. And slightly less than 8 percent resulted from encountering severe turbulence.

As for the flight crew failures, we feel these can best be counteracted by improving training, improved qualification requirements, and better cockpit discipline by all crew members. The emphasis in our regulatory program, our surveillance, and our enforcement activities is all pointed in this direction. The effects will not necessarily be apparent immediately, particularly where improvement of training is concerned. It takes time to obtain the full benefits from such programs. No improvement in crew performance can be expected unless the basic elements of qualification, ability and discipline are emphasized. Accordingly, we are concentrating our efforts in this area.

With respect to the 25 percent of this last year's accidents attributable to improper maintenance, we are again concentrating our efforts on improving the maintenance of aircraft by regulation changes, increased surveillance of maintenance practices and procedures, and a vigorous enforcement program.

The 18 percent of accidents traceable to equipment failures is the target of our efforts in the engineering field. In addition to changes in the basic regulations, we have issued during the past year scores of airworthiness directives to correct specific difficulties which became apparent during service. Many of these have been issued on an emergency basis and have called for special, even daily, inspections of certain suspect components, and the installation of redesigned parts to cure the defect. This, of course, is a continuing program, and is carried out with the cooperation of the carriers and the manufacturers of the aircraft and its components.

The new regulation requiring installation of airborne radar in air carrier aircraft, should go a long way toward reducing accidents caused by encountering severe turbulence associated with thunderstorms or precipitation. Due to the necessity of retrofitting a large part of the air carrier fleet, this program will require some time for its full implementation. By July 1 of this year, all turbine-powered aircraft will be so equipped. By this time next year, all the most modern and high-speed piston-driven air carrier aircraft will be so equipped. With this equipment, the pilot will be better able to avoid areas of severe turbulence in thunderstorm activity. Its value for this purpose has been well demonstrated by the record of one major carrier which has voluntarily installed the equipment on all of its aircraft. Since installation, the carrier has had no serious injury to passengers or crew as a result of encountering turbulence of this type in flight.

What I have referred to here by no means exhausts the list of things the Agency is doing. However, I think they give a clear picture of our activities in the field of aviation safety.

Before concluding my remarks on air safety, there are one or two other things I would like to mention, because they played such an important part in our progress during the past year. The subject of military participation in the Federal Aviation Agency is of course, a separate topic on the committee's agenda set aside for discussion at a later date.

However, I think it is worthy of mention in connection with the subject of air safety that we have received invaluable assistance from the military services in raising the technical qualifications of our own people. For example, 14 of our air carrier inspectors have completed the KC–135 qualification course of the Air Force. This has provided invaluable heavy jet experience for our inspectors, since the KC–135 is similar to the civil Boeing 707. Fourteen additional inspectors are assigned to the Air Force KC–135 school during the calendar year of 1960.

Six of our flight safety inspectors are receiving training in heavy helicopters of the Army. Seven are receiving training in advanced types of heavy helicopters by the Navy. Two of our inspectors have completed the Army helicopter instrument flight course. And one inspector has received familiarization training on a twin-engine Sikorsky helicopter from the Army. We currently have two of our flight test pilots attending military test pilots school, one with the Navy, and one with the Air Force.

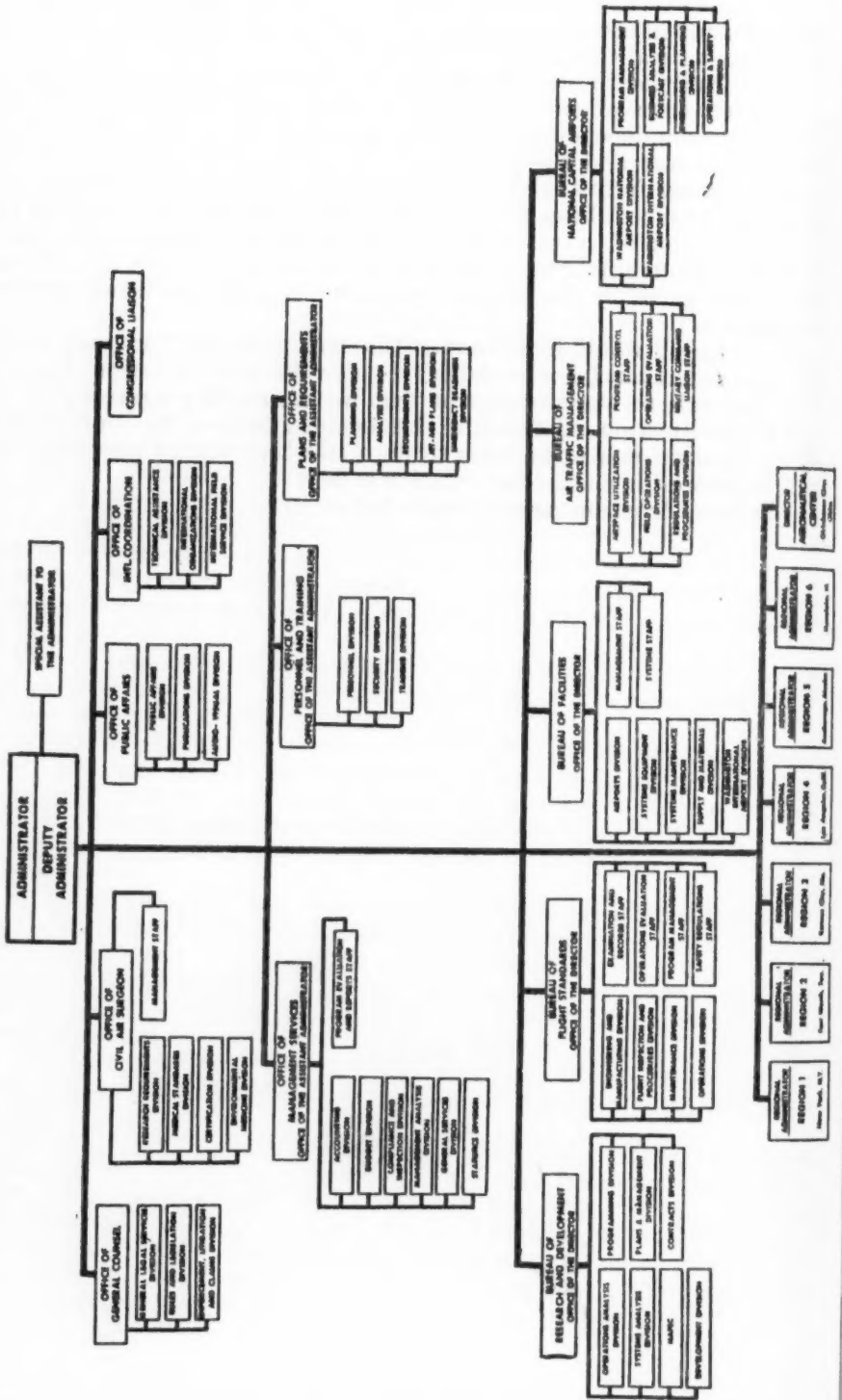
We have also been provided with 10 TV–2 training aircraft by the Navy for use in providing initial jet qualifications for our personnel at the Aeronautical Center in Oklahoma City.

These contributions are extremely helpful to us because the quality and effectiveness of our inspectors in supervising and checking flight crew members depends a great deal upon their knowledge of the particular aircraft and the problems it involves. Our goal is to have our inspectors fully qualified in the types of aircraft being used in the industry. Our abilities in this respect have been greatly enhanced by the cooperation of the military services, which supplemented in a valuable way the training received by our inspectors through attendance at courses given by the aircraft manufacturers in specific air carrier equipment.

In closing, I would like to assure the committee that I am very much encouraged; that I am confident the new Federal Aviation Agency has the tools to work with, and that we are moving aggressively in the right direction. I feel sure that our people have the courage and determination it always takes to do a steadfast job of pursuing the public interest in the field of aviation safety.

(Federal Aviation Agency chart follows:)

FEDERAL AVIATION AGENCY


ADMINISTRATOR
DEPUTY ADMINISTRATOR
SPECIAL ASSISTANT TO THE ADMINISTRATOR
OFFICE OF GENERAL COUNSEL
OFFICE OF CIVIL AIR SURGEON
OFFICE OF PUBLIC AFFAIRS
OFFICE OF INTL COORDINATION
OFFICE OF CONGRESSIONAL LIAISON
OFFICE OF PLANS AND REQUIREMENTS
OFFICE OF PERSONNEL AND TRAINING
OFFICE OF MANAGEMENT SERVICES
BUREAU OF RESEARCH AND DEVELOPMENT
BUREAU OF FLIGHT STANDARDS
BUREAU OF FACILITIES
BUREAU OF AIR TRAFFIC MANAGEMENT
BUREAU OF NATIONAL CAPITAL AIRPORTS
REGIONAL ADMINISTRATOR REGION 1
REGIONAL ADMINISTRATOR REGION 2
REGIONAL ADMINISTRATOR REGION 3
REGIONAL ADMINISTRATOR REGION 4
REGIONAL ADMINISTRATOR REGION 5
REGIONAL ADMINISTRATOR REGION 6
DIRECTOR MIKE MONRONEY AERONAUTICAL CENTER

Senator MONRONEY. Thank you very much General Quesada, for your statement and the time which you have taken to prepare it and to present it to this committee.

As the Federal Aviation Act was written, we recognize that action and final determination are matters affecting air safety and had to be expedited, and that a larger amount of authority had to be placed in someone to make the final decision.

Since you were the first Administrator of this enlarged and consolidated Agency, I was very happy that a pilot of considerable experience had been chosen as its head. I think for the record it would be good to tell us how long you have been a pilot and what type of aircraft you have been certificated to fly.

Mr. QUESADA. Mr. Chairman, I enlisted in the services in 1924 and started my military training soon thereafter. My piloting has continued ever since.

As far as the types of aircraft that I have flown, it would be a——

Senator MONRONEY. Beginning with what?

Mr. QUESADA. I started with the Jenny and I guess you could say from Jenny to jet. I started with the Jenny, then went on to a DH, then to the SPADS and the old wartime aircraft. Then, as far as my military service is concerned, we were then flying jets, and my most recent exposure to piloting has been the completion of a course of instruction given at the Castle Air Force Base in California and have qualified in the KC–135, which is the equivalent of a 707.

Senator MONRONEY. That would make you a licensed jet pilot for transport aircraft.

Mr. QUESADA. I have qualified in a 707. I wouldn't want to leave the impression that I have the type of rating that the 707 pilots have to carry passengers, but I am a qualified pilot in it.

Senator MONRONEY. It wouldn't take a lot of transitional hours before you could be certificated as a pilot to fly passengers.

Mr. QUESADA. I have taken the same course that our inspectors have taken and that the Air Force gives to their personnel who fly the KC–135.

Senator MONRONEY. How many hours have you logged since 1924, do you know?

Mr. QUESADA. After 10,000 I didn't take count very much. I would guess it runs from 12,000 to 15,000.

Senator MONRONEY. But you still are an active pilot?

Mr. QUESADA. Yes, sir, I am still an active pilot.

Senator MONRONEY. You mentioned in your statement the subject of medical examination for pilots. Do you yourself follow the rules that you make on frequent medical examinations?

Mr. QUESADA. Yes, sir. My medical certificate is current. I might just add that I do what I wish others would do. When I take my medical examination I go to a doctor with whom I have no relations, a doctor that I don't know. When I took my last medical examination I had never seen the doctor before. What I am trying to say is that I conform to the practice of detaching myself personally from the person who gives me my medical examination. I had never seen him before.

Senator ENGLE. Would the Chairman yield?

Senator MONRONEY. Yes.

Senator ENGLE. I am very much interested in that comment; because I understand that you are going to promulgate a rule now under which private pilots can be examined only by designated doctors, is that right?

Mr. QUESADA. Such a rule is in the process of preparation; yes, sir.

Senator ENGLE. The assumption back of that rule is that the family doctor might fake up the examination; am I to understand that?

Mr. QUESADA. That is not the assumption.

Senator ENGLE. What am I to gather from the statement you just made, that you wouldn't go to your family doctor; that you wanted to go to a doctor who had never seen you before, and apparently or presumably wouldn't know anything about a hidden defect if you had one?

Mr. QUESADA. I go to a specialist, is the point, Senator. I have gone to a man who is a specialist in aviation medicine, and who can examine me in that regard and in that light.

Senator ENGLE. The private pilot physical examination doesn't require a fellow to be a superman; does it?

Mr. QUESADA. None of our requirements require anybody to be a superman, Senator.

Senator ENGLE. Why do you have to have a specialist examine a man for a private pilot's license?

Mr. QUESADA. I think it might be well——

Senator ENGLE. When you get up into the transport category, and all that, I might say there is some justification for this. But there are two things about this: It seems to me that you are going too far with it, and it seems to me secondly that you base it on an assumption that is wholly not in evidence, and that is a reflection on the medical profession, and that is if you assume that a man can't go to his family doctor to be certificated for an ordinary private pilot's physical examination because the family doctor might sign a certificate rather than make him toe the line on the qualifications. That is precisely the meaning I read into the statement that you made, that is, that you went to a doctor who never saw you before. I think the medical profession will join the airline pilots and a lot of the private flyers in taking high umbrage at that kind of a reflection on them.

Somebody was going to make a comment. Were you going to refer that question?

Mr. QUESADA. I was going to say it is a medical question, and conforming to our general policy I would like to have a medical man answer it.

Senator ENGLE. I would like to have a medical man tell me why an ordinary country doctor can't give a physical examination for a private pilot's license. If you have an expert to explain that, let's have it.

Mr. QUESADA. Dr. Goddard.

Dr. GODDARD. Senator Engle, the private physician can, if fully aware of the needs of pilots and the regulations of the Agency, perform these examinations. However, in many instances he is not. That is one aspect of it.

Senator ENGLE. Let's stop right there.

Dr. GODDARD. Yes, sir.

Senator ENGLE. You have a piece of paper you take out there. I have been through these examinations. In fact I take one every 2 years. So I know precisely what I am talking about. You have a piece of paper there. And you take it out and it tells the doctor what the qualifications are. Are you saying that he can't read?

Dr. GODDARD. The only evidence that we have on that, sir, is that about 75 percent of the certificates that are incompletely submitted, or submitted in an incomplete form and require ultimate rejection, come from the nondesignated physician. The American Medical Association recently considered this entire problem at its meeting in Dallas, the December meeting, and it was brought before the house of delegates. The American Medical Association passed a resolution which would support the proposed plan of the Federal Aviation Agency which would require the individual pilot to go to a designated medical examiner.

Senator ENGLE. I don't care what they said. I am a private pilot and I don't like it. I want to know what justification you have for saying that any doctor downtown can't tell me whether I can hear a watch tick at 20 feet, and can't read an eye examination chart, and can't tell whether my blood pressure is within acceptable limits, and can't tell whether or not my heart is ticking right, and all of that. All a fellow has to be in order to be a private pilot is to be sound of mind and reasonably sound of limb. He doesn't have to be any superman.

Dr. GODDARD. No, sir; we don't feel that he has to be a superman, either.

Senator ENGLE. I would just like to have you tell me what there is about a doctor right downtown who can't certify to this examination. What special knowledge or training does he have to have in order to be able to give a competent physical examination?

Mr. QUESADA. Senator, we respect your opinion on this, you can be assured, but we have gone to medical groups who are experts in this as well, and they advise us that we are on the right course of action. It would seem clear to me that the normal hazards of flying that are inherent in flying, and the necessity of a physical well being while flying, would suggest that the physician who conducts the examination should be a man who is trained in this area.

Senator ENGLE. I certainly disagree with you. And let me say this, General: People drive up and down this highway, they pass each other at a combined speed of 120 and 140 miles an hour, and no one has looked at their eyes or paid any attention to their hearing for a long, long time. Flying is basically simpler than driving an automobile, and you do it as well as I do, and there isn't any justification at all for putting the private pilots of this Nation in a position where they have to traipse around and run down a physician who has been specifically designated and who won't change his qualifications and who won't crack a book, but who will pick up the certificate, the one that I take out, go through it, certificate what it is, and that will be the examination.

Mr. QUESADA. I don't want to argue with you on this, Senator, because you are certainly entitled to your opinion, but I think public opinion says that you are speaking of a neglected area; that the conditions that you describe now as normal are conditions that the public

is now objecting to, as evidenced by the fact that they are now requiring more rigid physical examinations on the part of the automobile driver. I would also like to remind you, sir, that in the airplane the airplane turns around three axes, whereas the automobile can only turn around one, and this is a very important factor.

I don't think that the complexities of flying an airplane are comparable with those of driving an automobile.

Senator MONRONEY. May I ask if the airline pilots, those holding commercial licenses, go to designated medical examiners?

Dr. GODDARD. Yes, sir; they do, and they are required to go every 6 months for a physical examination from a designated medical examiner.

Senator MONRONEY. I seem to recall that this is not a new thing; it seems to me if I remember correctly, the old CAA designated certain medical inspectors, at least for students wishing to begin flying, and they had to appear before designated physicians. They would leave their hometowns, have to come to the capital where the designated physician was, and take their medical examinations by an appointed or designated medical examiner. Is that correct?

Dr. GODDARD. That is correct, sir. For many years the agencies required all pilots to go to designated medical examiners. However, due to a shortage of designated medical examiners, and other factors, this was dropped and it has not been resumed since World War II.

Senator MONRONEY. It was dropped during the war when physicians were very short and it was very difficult to obtain qualified people; is that correct?

Dr. GODDARD. That is my recollection. However I would like to check for the accuracy of the record.

Senator ENGLE. Will the Chairman yield?

Senator MONRONEY. Yes.

Senator ENGLE. I just happened to be looking through this magazine, the Pilot, which was put in a few minutes ago, and I will have something to say about that. I happened to read the letter read by Mr. Geisse, if I can find it, and he was in the CAA at that time, and he said that the requirement wasn't lifted because of the shortage of doctors at all—that it was lifted solely and only because they couldn't see any sense of asking private pilots to go to specialized doctors for the simple type of physical examination that is and ought to be required in a pilot's examination.

If I can find it, I will be delighted to read it to you. But if I can't lay my hand on it right at the moment—here it is. Here is what he says about it: Mr. Chairman, if you will permit me to read it.

Senator MONRONEY. Certainly.

Senator ENGLE. I will not read it all:

"With reference to the matter of what doctor can certify as to physical condition of an applicant for a pilot's license or for continued licensing of a private pilot, I am still very much of the opinion, which was the case when I was Administrator, that this should be done by any qualified physician and not necessarily a specially designated one. John is correct—"

this is in the letters to the editor—

"that the decision I made when I was Administrator was not based on a lack of doctors due to the war but on a matter of policy that for the private pilot this seemed to be a perfectly reasonable course to follow and one which resulted

in far less inconvenience to the applicant without diminution of the safety."
Seems that someone in FAA was afraid to state the facts when he cooked up the shortage of doctors explanation.

Was that you, sir?

Dr. GODDARD. No, sir.

Senator ENGLE. It is signed by Mr. J. H. Geisse, Washington, D.C.

Mr. QUESADA. What is the date of that?

Senator ENGLE. The letter?

Mr. QUESADA. Yes, sir.

Senator ENGLE. It is in the issue which I assume you read with great care, because you put it in the record, of January 1960, of the Pilot.

Mr. QUESADA. I can assure you I can't remember the exact date of every record I have read with great care, and shouldn't be expected to.

Senator ENGLE. At least I see you read the editorials.

Mr. QUESADA. I read some of them, but not all. If you are going to put it in the record you ought to put in the date.

Senator ENGLE. The date of what?

Mr. QUESADA. Of what you read.

Senator ENGLE. I say the letter appears in the letters to the editor of the January issue of the Pilot magazine. The letter isn't dated.

Mr. QUESADA. I assure you I have never read this, whatever you are reading from.

Senator ENGLE. It is right here where you can locate it, on page 10 and page 14. It specifically disputes the statement made by the witness that it was the shortage of doctors during the war that lifted this requirement. And it is made by the man who made the ruling.

Mr. QUESADA. Sir, I must assume that this is a letter to the editor?

Senator ENGLE. That is correct.

Mr. QUESADA. So therefore not to us.

Senator ENGLE. That is correct.

Mr. QUESADA. So therefore there is no reason why I should have read it carefully.

Senator ENGLE. I didn't assume you were going to read it carefully, except inasmuch as you handed up these magazines I thought you had been reading them.

Mr. QUESADA. In the first place, the person to whom you refer is an inventor of a cross-wind landing gear and is not a doctor.

Senator ENGLE. Let's see what he said. I will go back again.

Senator SMATHERS. Mr. Chairman, I didn't get to hear the doctor's answer and I have been sitting here, not reading very carefully something that didn't pertain to this hearing at all, but to bring myself up to date, as I understand the question it is as to why the FAA expects to designate certain doctors to make examinations of private pilots, and the Senator from California wants to know why all doctors could not do that. Is that correct?

Senator MONRONEY. That is correct. And to clarify the record, the chairman asked if this had not been historically the custom, up to a certain point. I did not know where it was cut off. The doctor testified then that it was cut off during World War II. I do not remember whether I suggested the shortage of doctors or whether he did. But I presume there was a shortage of doctors existing at that time.

Senator SMATHERS. Doctor, may I ask you this question: Do you *think there now is a shortage of doctors?*

Dr. GODDARD. For these purposes I do not believe that there would be a shortage of doctors, sir.

Senator SMATHERS. In other words, what you are saying is that all doctors would probably be qualified to make these particular examinations for private pilots.

Dr. GODDARD. May I answer that in this way, sir: Inherent in this proposal is the concept that any doctor who wishes to apply to become a designated physician may do so.

Senator SMATHERS. Do you expect to make it possible then, through application, for all doctors to be qualified to give this application, those who want to?

Dr. GODDARD. We will select doctors according to geographic distribution, their particular training, and one of the things we want to make most certain of is that these physicians are readily available to the pilots.

Senator SMATHERS. Don't you think actually the pilots—I am not arguing with you—the pilots who would have to take the examination would be the ones who would know even better than you?

Dr. GODDARD. Of course the pilots, sir, have been afforded an opportunity and will be afforded continuing opportunity to comment on the availability and the desirability of this type of proposal.

Senator SMATHERS. Doctor, right on that question, have you taken this up with the American Medical Association? Did they approve of your selecting certain doctors only to give this examination?

Dr. GODDARD. Indeed, sir, they did. As I mentioned earlier, the house of delegates, which met in December, considered this issue, and went on record as formally approving the proposed rule. It is further clear that this is not an unusual policy; that physicians are selected by Federal agencies for other purposes, and they did not object at all to the idea that a Federal agency would designate physicians for a specific purpose.

Senator SMATHERS. Doctor, it seems to me, hearing it just lately here, the point is whether or not you set up a procedure whereby any doctor who wishes to qualify to give pilot examinations can qualify. Now, when do you expect to get that particular procedure in operation?

Dr. GODDARD. This procedure could be in operation by July 1 of this year.

Senator SMATHERS. I guess you would say, would you not, that the procedure will not be of such a character that any qualified doctor who wanted to qualify could not qualify. In other words you are not going to have it so geared that it will eliminate ordinary doctors?

Dr. GODDARD. No, sir, it has never been our intention to eliminate the family physician. I myself was a family physician.

Senator SMATHERS. So it is your opinion that this procedure would enable all family doctors and all local doctors, wherever they may be, who wanted to qualify, to qualify.

Dr. GODDARD. Yes, sir, as long as—again it will be consistent with our needs according to geographic distribution.

Senator ENGLE. Will the gentleman yield?

Senator SMATHERS. Let me finish this and I will yield.

Doctor, I think where we may be getting into some danger is this: Are you not going to let doctors who may want to qualify, and who are otherwise qualified, not qualify merely because you say we have enough, we will say, in the south Florida area; we don't want to qualify any more? Is that going to be your position on this?

Dr. GODDARD. Within the purposes of this, yes.

Senator SMATHERS. Would you not then be setting yourself up as an agency which would permit certain doctors to get a certain type of business but rather arbitrarily say that others equally well qualified cannot get that business? Is that in keeping with the ordinary democratic process of this country?

Dr. GODDARD. I can say only, sir, that this matter was carefully considered, it was concurred in by the American Medical Association, and the economic factor we do not feel is a major one.

Senator SMATHERS. Do you not feel that it would be, however, a wiser course if you permitted every doctor who wanted to qualify and who could qualify to then become qualified to give these examinations by eliminating this question as to who is a special doctor and who isn't a special doctor?

Suppose the Supreme Court of the United States did not allow all lawyers to practice before it on the ground we have already too many lawyers. That would not be a democratic process and would deprive some lawyers of the right to make a livelihood while guaranteeing others the right to make a livelihood. You wouldn't approve of that kind of rule would you?

Dr. GODDARD. No, sir. I don't think we are in any way restricting the ability of a physician to practice his art.

Senator SMATHERS. Right on that point, are you not doing it though, because here is a man qualified, graduated from a fine school, and yet here is a pilot, Senator Engle, who comes to him and he says, "You are qualified; I wish you would examine me because you are convenient to my home." But he says, "I am sorry I can't; I have applied to the FAA," or whatever it is, "and they refuse to let me qualify myself even though in fact I am qualified."

Dr. GODDARD. Senator, as a practical matter, I believe that any physician who applies, and demonstrates an interest in this deal, will be qualified.

Senator SMATHERS. Why don't you just put that in your rules and you have no more problem.

Mr. QUESADA. Senator, let me try to qualify this; will you?

Senator SMATHERS. All right.

Senator ENGLE. Will the gentleman yield? That is precisely what I am driving at. You have nailed the thing down. He walked all around the bush now and got right back to where he started. If his answers mean anything, they mean that he ought not to put the rule in because it wouldn't mean anything. It is just giving a lot of people a headache and some more paperwork.

Mr. QUESADA. May I clarify your point, Senator Smathers?

You have made a very good point. Any doctor who can qualify should be able to qualify without regard to geographic limitation, and if our rule in any way brings violence to that we will correct it.

Senator ENGLE. All right.

Senator MONRONEY. Just a moment, please. I would like to comment on this.

This committee previously has heard, on many occasions, testimony for the establishment of an aviation medical group. Good cases have been made by various aviation leaders in medicine throughout the past years.

We have never felt it should be, in this committee, separate and apart from the Federal Aviation Agency or the Civil Aeronautics Board. It should be a part of it and something which could make use of the medical techniques and experience both of the military in high-altitude flying and other things which are peculiar to aviation. It is my understanding that what is being done, at least separate and apart from the indiivdual problem of certification of a private pilot, is to improve the basic knowledge and the specialization of problems associated with flying, and particularly with high-altitude environment.

I presume that this is a part of the desire of the Federal Aviation Agency to increase the general knowledge by asking doctors, if they will, to take briefing courses or to accept information, which is well known and verified, in the specialized field of aviation medicine to increase their competence in this particular specialty. Is that correct?

Mr. QUESADA. That is absolutely correct. That is our objective and that is what we intend to do.

Senator MONRONEY. And you are not going to do any violence to any individual practitioner, but you are asking those who wish to do so to at least accept briefings and the latest and most current requirements of aviation medicine.

Mr. QUESADA. And qualify. Senator Smathers has made a very good point. If our rule in any way brings violence, as I have said before, to the principle he brought up, it will be corrected.

Senator ENGLE. Will you tell me what kind of qualifications you are going to establish before a doctor can have this important certificate which permits him to give an ordinary examination to see if a fellow is alive and warm enough to fly an airplane as a private pilot? You are not going to put on geographic limitations?

Mr. QUESADA. This is contained in the "Notice of Rule Making."

Senator ENGLE. That doesn't tell me a darned thing. I don't have a "Notice of Rule Making" before me.

Dr. GODDARD. The qualifications that we are now considering, first of all that the man be a graduate of a grade A medical school, that he be a member of the state or local medical society, that he has demonstrated an interest in aviation medicine—these are the basic qualifications that we are considering. He need not be a specialist in aviation medicine.

Senator BARTLETT. Mr. Chairman, I have to leave, but before doing so may I ask a question on another subject?

Senator MONRONEY. Yes, sir.

Senator COTTON. Mr. Chairman, just a point of order, and then I will get out of the way of my friend. I understand this committee won't meet this afternoon because of a Democrat policy committee meeting. The Republican policy committee meets at 12:30. I have been addressing the Chair for some time and the Senator from California has continued to monopolize this thing, and I want, before I leave, to ask a couple of questions.

Senator BARTLETT. I have only one, and it is very brief.

General, I would like to direct your attention to page 16 of your statement. At the top of the page, in your item No. 3, the last sentence, in which you say, "The company records for which he was responsible were falsified to conceal these facts."

Do you mean falsified by the pilot or by the company?

Mr. QUESADA. By the pilot. He was the custodian. It should be assumed by the pilot. He was the custodian of them.

Senator BARTLETT. Thank you.

Senator COTTON. Mr. Chairman, it is very interesting that the Senator from Alaska had a question which was exactly on the same paragraph. In the light of all this conversation about examination of pilots, I have been curious, ever since I heard your statement on the top of page 16, where you say,

> A fatal accident—15 lives lost—in which we found the captain had not taken the required medical examination for 3½ years, was 2 months overdue on the required proficiency check and was therefore legally unqualified to fly.

And then the company records for which he was responsible were falsified and concealed these facts.

What you do not indicate is whether his physical condition actually was causal or a contributing factor to the death of 15 people. Was it, and if so, what was the matter with him?

Mr. QUESADA. The determination of probable cause is a responsibility of the Civil Aeronautics Board. Whether that was a contributing factor, they will have to determine. I am only citing the facts that we revealed and require action on our part.

I might tell the committee the fact that this was undetected by my Agency for 9 months is not a source of satisfaction to me. As a matter of fact, I will accept your admonition without it being spoken.

Senator COTTON. What I am getting at is that—I take it that the investigation was not completed?

Mr. QUESADA. It had not been completed to determine the probable cause.

Senator COTTON. So that, at least not in open session, it wouldn't be contributing to the public welfare and to the confidence of the public to shoot from the hip and to make any suggestions.

May I ask you in this way, and I think there will be no adverse effect on anybody: Thus far, from what you know of the investigation—and I understand that the representatives of the FAA participate in these investigations with the CAB——

Mr. QUESADA. Right.

Senator COTTON (continuing). Has there been some evidence that some physical disability did in some way figure in this or cause this accident?

Mr. QUESADA. I will let the doctor answer it. I know what the answer is, but it is a medical answer and it might be well for him to answer.

Dr. GODDARD. Senator Cotton, there was concern for this man's medical condition. There is reason to be concerned. As Mr. Quesada has stated, however, the effect of this, in terms of determining probable cause, is under study by the Civil Aeronautics Board.

Senator SMATHERS. Mr. Chairman, right on that point. It will help you.

Senator COTTON. I am glad this is in the statement, but here we are bickering about medical examinations, and sooner or later I think it will be highly imperative for us to know whether 15 people are dead because a pilot was not properly examined by someone who would make an objective report, and sooner or later we can have that.

Mr. QUESADA. We agree with you. I cited these cases, if you will go back, only as an indication of laxity. It was so lax that this event occurred.

Senator SMATHERS. Mr. Chairman, right on that point, I would like to ask unanimous consent that the illustrations which General Quesada has given us, starting on page 15 of his statement and through page 16, that the committee be supplied, on a confidential basis, with the details of those particular accidents, the inspector from the CAB, and the FAA, the date of the accident, the airline, the pilot involved, et cetera.

Senator COTTON. I don't know whether the Senator from Florida was here at that time yesterday but it was suggested, was it not, that we would later have an executive session, and have this information for the committee?

Senator MONRONEY. That related more or less to the incomplete and inconclusive reports on accidents of this year. But I do think that there could be an addendum for having this information available for the committee. I would ask the Administrator to supply it.

Mr. QUESADA. We will do so. In at least one of the cases the docket is closed. We will turn the whole docket over to you.

Senator MONRONEY. At this time, I think, because of the engagements of other members of the committee, and the impending Democratic caucus, we will stand in adjournment until 10 o'clock tomorrow morning, at which time I would hope that General Quesada could return, and we can resume his questioning.

It will be largely, I hope, confined to the question of air safety during this period of the study. We have a separate part of these hearings set aside for pilot certification and questioning in which I think we intend and I hope will go forward fully into the recommendations.

(Thereupon, at 12:18 p.m., the subcommittee was adjourned, to reconvene at 10 a.m., Wednesday, January 13, 1960, in Washington, D.C.)

REVIEW OF THE FEDERAL AVIATION ACT
(Air Safety)

WEDNESDAY, JANUARY 13, 1960

U. S. SENATE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
SUBCOMMITTEE ON AVIATION,
Washington, D.C.

The subcommittee was called to order at 10 a.m., in room 5110, New Senate Office Building, Hon. A. S. (Mike) Monroney presiding.

Senator MONRONEY. The Subcommittee on Aviation will resume its hearings.

We are honored today to again have General Quesada, who testified yesterday, to answer some questions. In reviewing his statement, I find it a very complete statement; one which goes into many and important phases of our aviation safety and other operations related to aviation.

We have set aside, as we announced, to a later date hearings which will specifically deal with pilot certification and qualification and matters of that kind.

I think it will probably expedite the hearings to keep it in that order and not go into such matters at this time. We can ask General Quesada to come back at some later time when we have this particular phase before us to elaborate more fully on that, and to hear the testimony of others who are interested in or are contesting some of the methods or procedures that have been used in issuing these flight regulations and orders.

Therefore, I think we will concentrate today on a discussion of the matters directly related to aviation safety.

In your study, General, of these aviation accidents, I commend you for the speed and activity in not waiting until investigations are completed before moving in and ascertaining from your own sources the vital information. If defects are inherent in planes, procedures, or operations, we can't wait too long. It is to your credit that these matters are being looked at with great immediacy and great speed.

Is there any breakdown that you have regarding major accidents involving air carriers in the past year? In other words, which were in approaches to the airport; which were disasters in midflight; and which were properly and appropriately related to turbulence and extreme weather conditions, and such categories as that?

Since there was no general pattern such as we had last year in midair collisions, we are trying to find out what you have to say about general categories so that we might more properly evaluate this year's accident records.

FURTHER STATEMENT OF E. R. QUESADA, ADMINISTRATOR OF THE FEDERAL AVIATION AGENCY; ACCOMPANIED BY JAMES T. PYLE, DEPUTY ADMINISTRATOR, FAA; BURLEIGH PUTNAM, BUREAU OF FLIGHT STANDARDS; DR. JAMES GODDARD, CIVIL AIR SURGEON, FAA; DAGGETT H. HOWARD, GENERAL COUNSEL, FAA; AND H. L. REIGHARD, CHIEF, MEDICAL STANDARDS DIVISION, OFFICE OF CIVIL AIR SURGEON, FAA

Mr. QUESADA. I don't know if they are so broken down, but if they are not we will do so.

Are they?

Mr. PUTNAM. No, sir.

Mr. QUESADA. They are not broken down in that manner, but we can do so.

Senator MONRONEY. You have your experts here. Let us start in on the accidents that involve approaches, landing approaches. We have had some accidents, some fatalities that did involve the critical time of the aircraft and pilot in approaching for a landing, such as the Electra landing at La Guardia. I am sure you have devoted a great many man-hours to that.

This is a good illustrative position that we might explore first, if you care to, while your staff may be trying to arrange others for later discussion.

Mr. QUESADA. With respect to the Electra accident that occurred at La Guardia, February 2, the Civil Aeronautics Board has made its determination as to probable cause. It might be well that that portion of the probable cause of accident be inserted in the record.

Senator MONRONEY. We have had a rather full discussion of this accident with Mr. Bakke. To brief his conclusions, there was evidence of lack of proper familiarity with the aircraft. The pilot had had only 48 hours, if I remember correctly, in the Electra. This was evidenced, according to his testimony, by the fact that the pilot was using the autopilot almost to conclude his approach and to make his landing.

Further, the testimony was, there was unfamiliarity with both the vertical speed indicator, which was new and very tricky, in comparison with the old vertical speed indicator that he had been used to. And further, the drum altimeter also has a somewhat unusual reading for a person not yet completely familiar with the new instrumentation.

The conclusion was that there were several areas of pilot error, particularly in altimeter setting, that did not reflect the barometric reading at the time of landing but reflected a reading of a previously announced setting by the airline.

When we got all through with it, our question to Mr. Bakke was, if you had had high-intensity approach lighting on the dark side of La Guardia Field, would this accident have occurred?

Mr. Bakke's statement, plainly and flatly, was that it would not have occurred.

Mr. QUESADA. It is very clear that you have a very thorough knowledge of this report and have analyzed the findings.

In respect to the facilities that did exist, it is true that there was no high-intensity lighting system as an extension to that runway. I think it is only appropriate, and I think you would like me to bring out the conditions that prevented it from occurring.

Again, as in this case, we have a conflict between varying forms of transportation. The facts in this case are that there is a channel to commerce—that is, sea commerce—that passes across a northern extension to this runway. It is impossible for the port authority, which is responsible for the lights to which you refer, to get permission to install the necessary abutments upon which to install the lights.

In respect to the lights, we had a lights program. We had the money to buy them and had the abutments necessary for their installation to install them. We would have been prepared to install the lights.

With respect to the ILS pointing in that direction, in order to install the ILS pointing in a normal direction it would have been necessary to have a physical platform upon which to locate the equipment, and it would have been necessary to have built filled-in land out into the sound, into this area wherein there was a channel to sea commerce.

So we also had the ILS program and the money for which to purchase it, but we could not install it for the reasons that I have just enumerated.

However, it must be brought out, Senator—and I am sure you understand this—that the conditions that we imposed for this particular approach gave consideration to the facts of life. It gave consideration ot the fact that there was no ILS, or that it was only a back course to an ILS. It gave consideration to the fact that there were no such lights.

The minimum limits to which the pilot was allowed to go while approaching on this runway were different than the limit to which the pilot was allowed to go when approaching on other runways at La Guardia.

Senator MONRONEY. Do you state those? There was a 400-foot ceiling allowable under instrument conditions.

Mr. QUESADA. The limit on this approach was, approaching on this runway from that direction, was 400-foot ceiling and 1-mile visibility. On the ILS approach, which is the opposite direction, it was 300 and 1 mile. So it took consideration of the varying physical facts.

Senator MONRONEY. What are the ceilings on the longer runway? This runway, as I understand it, is about 4,800 feet.

Mr. QUESADA. It is 4,900 feet, I believe. To be exact, it is 4,936 feet.

Senator MONRONEY. At the approach end it has a large dike that tends to make the plane grasshopper over the dike to sit down on the runway. It is about a 6- or 8-foot construction, if I recall.

Mr. QUESADA. If an airplane had to grasshopper over the dike, I am almost certain it would be below a normal glide path, if he did. But I must say, Senator, the tendency is to grasshopper over a dike. The tendency is to move over a dike like that whether you are going to hit it or not. To be honest and fair, what you are saying is true.

Senator MONRONEY. With a 4,900 foot runway, with the dark hole

over the black water, under an undulating instrument ceiling, and at one of the busiest airports in the world, I am inclined to say that the purpose of ground approach equipment is not only to aid the pilot but to help forgive an error which even an experienced pilot might make under tense conditions knowing what he faced in putting a heavy performance plane down on a short runway without glide path by radio, without visual reference to anything excepting the dim runway lights.

The point that I want to ask you about is this: Do you have authority to close runways which, under certain conditions, would be dangerous to traffic and to condition the reopening of those runways on the installation of necessary landing aids which you would consider reasonably required in the interest of air safety?

Mr. QUESADA. In respect to your first question——

Senator MONRONEY. I know this is a problem primarily of the New York Port Authority. They built the airport. The Federal Government could furnish 75 percent of the money for high-intensity runway lighting. However, they get easements and rights of way, and you help them on approach lights, but the motivation is supposed to come from the local airport authority. We don't run the airports. But we do have the right, I think, under the Federal Aviation Act, to require certain minimum safety standards; I wonder, since this is illustrative also of what goes on at Midway, Chicago, and dozens of other airports where the beer signs and the cars running along a busy highway are more visible to the pilot coming in than the approach lights, if under your authority you can issue an ultimatum to the airport authorities to say, Do this or we close runway 22?

Mr. QUESADA. Senator, the first part of your question, in which you recite the necessity for certain aids to pilot personnel, we share, very definitely, as evidenced by the fact that we had in fact programed the equipment for this particular location.

Senator MONRONEY. I notice incidentally you have programed today high-intensity lighting for the Chantilly Airport.

Mr. QUESADA. Yes.

Senator MONRONEY. So as it's being built we will have approach lighting rather than beer signs.

Mr. QUESADA. Dulles International Airport will have one of the most modern facilities in the world, and we are programing to that end.

In respect to closing a runway, we do have the right to close a particular runway if it is considered to be dangerous and contrary to the public's interest.

In this particular case, the action that we took, with the knowledge of all, and with the cooperation of all, was to raise the minimums there to be compatible with the facilities that did exist. We don't feel that the minimums that are applied to the extension of that particular runway are dangerous. We feel that they are reasonable. Thousands and thousands of landings have been made on it under the very conditions that existed on this particular occasion. Other aircraft landed just before this particular occasion, and other aircraft landed just after. However, there is no question but this was a tragedy that shocked the Nation. I can only say that in this particular case it was

not considered the minimums that were established, which were over and above those which existed elsewhere on that particular airdrome, it is not considered that they were hazardous and hence we didn't close it.

Senator MONRONEY. Your minimum was 400 on that under instrument conditions. But the qualification of the pilot on that new type of plane was an added 100 feet—new pilots on new equipment was an added 100 feet.

Mr. QUESADA. Yes, sir.

Senator MONRONEY. The testimony of Mr. Bakke the day before yesterday was that American Airlines waived this extra 100 feet of safe ceiling with only 28 hours of flight time behind this particular pilot at the time this waiver occurred. I think he had 48 hours at the time the plane went in.

It seems to me that with the introduction of this new type aircraft, which is of higher performance than the old craft to which a pilot may be accustomed, that perhaps it might be wise for the Federal Aviation Agency, and the Administrator, to get just a little hard-boiled with some of these airport people. If they are going to tolerate the lack of these landing aids, the importance of which this committee has emphasized time and time again, it should be pursued with great speed.

In our report on the Federal Airport Act in 1958 we suggested that where local municipalities and local governing bodies failed to cooperate in the installation of high-intensity approach lighting, that the Federal Government be empowered to condemn the land if necessary, to secure the easements, to put the lighting in, and then to charge that cost back to the airport authority or to the municipality on future Federal grants that would be made. I think this is the only runway open today at La Guardia; I think the other one is closed and is still being used with the still dark northside of that runway; is that true?

Mr. QUESADA. That is correct, Senator. The minimums on this runway, instead of being 400 feet and 1 mile, are in fact 400 feet and three-fourths of a mile. I should correct that.

Senator MONRONEY. That is not very much visibility. Three-quarters of a mile visibility takes you over all the dark water on the approach. You are familiar with that approach.

Mr. QUESADA. It does. That is right. However, the rules are before he is allowed to go before his 400, he must see the field. I don't want to debate this, Senator, because you are right. What you have said is absolutely correct.

The question, the second part of the question which bores in on the fact that we permitted the company to waive a certain limitation of pilots with less than a hundred hours, is also a good point, and we have taken steps to eliminate this privilege of waiver, and I have to say perhaps we should have taken it long ago.

We are not infallible, Senator.

Senator MONRONEY. Certainly not. There are new problems coming in all the time. The fact that you are willing to move, when you find conditions, is important. I am very glad to know that you are doing that, because certainly it is not to the discredit of the pilot that he should be confronted by a most difficult assignment beyond his capabilities in that particular new model plane, which he tried to

bring in under extremely marginal conditions. I would have no criticism of the use of runway 22, if you were under visual conditions or if your ceiling were high enough. But there is only a split second allowed for error, and I think that plane lands at 125 miles an hour. With only several hundred feet beneath him, this, as an old pilot yourself, is enough to cause a great deal of tension in the cockpit.

Mr. QUESADA. It does, definitely. No question about it.

Senator MONRONEY. Is there anything that you can do to speed up on this high-intensity approach lighting? On how many fields have we secured high-intensity approach lighting in the past year?

Mr. QUESADA. I will be glad to furnish the committee a list of the fields that have high-intensity lighting and the fields that are programed for high-intensity lighting. I will be glad to insert it into the record. I want to say to the committee that our program in the field of research and development is designed to develop a high-intensity lighting system; runways, is perhaps our highest priority program. We have three sets of lights installed in one location at Atlantic City that can be observed, measured, and tested under identical conditions in good and bad weather. It is perhaps the highest priority program that we have.

The necessity for high-intensity lighting is very marked. We have 54 locations programed in the 1960 budget.

Senator MONRONEY. That is money available today?

Mr. QUESADA. Money available today.

Senator MONRONEY. Is that 54 airports or 54 approach lights?

Mr. QUESADA. Fifty-four locations.

Senator MONRONEY. That is airports?

Mr. QUESADA. Yes, sir.

Senator MONRONEY. In other words you don't light one end of the runway. You light both ends of the runway; unless you have a definite wind pattern that would make a very high percentage of the landings in one direction.

Mr. QUESADA. As a rule you make a high percentage of your landings in one direction. But I don't want to leave the impression, Senator, that this program in every instance provides high-intensity lighting as an extension of every runway, because I will check to find out if this is the case. But I don't want to, by my words now, leave that impression.

Mr. PYLE. Mr. Chairman, let me be sure we all understand what we are talking about. The approach light installation is made as a part of the ILS system. Therefore it is tied to the ILS system. In the great majority of airports there is only one runway so lighted.

Senator MONRONEY. In the case under discussion then, we would never have approach lighting because the ILS system doesn't work on the northside of La Guardia. That is completely blind.

Mr. PYLE. This would be a second ILS. As Mr. Quesada pointed out, a second ILS is to be installed on runway 22, the runway in question, together with an approach light system.

Senator MONRONEY. That would be on the north end?

Mr. PYLE. That is correct.

Senator MONRONEY. I thought I understood the gentleman to say that it involved such a high expense and such a major ground fill to install your radio systems there that it made it very difficult for operation?

Mr. PYLE. I was talking about the program of a second ILS and associated approach lighting.

Senator MONRONEY. You don't have to have an ILS to make very valuable assist to a pilot in affording him the high-intensity lighting. It doesn't have to be a unit package at the moment. It would be better to get your high-intensity lights in if it is a question of waiting 2 years to get the ILS in.

Mr. QUESADA. Senator, there is a technical complexity here that I will try to explain.

The ILS, for all practical purposes, on the front course, as differentiated from the back course, provides you with a cone down which you must fly. In order to get the maximum use of this ILS or the cone, and to permit you to come very close to the ground with reasonable safety, it also requires that there be a high-intensity lighting system as an extension under this cone. To permit a pilot to come down the cone without the lights would in effect negate the purposes of the system; because it is the interplay between the lights and the cone, so to speak, that make it possible each to use the other.

Senator MONRONEY. Excuse me for being ignorant on this, but I think lighting and ability to orient yourself with the ground and the runway and a nice beckoning finger down the center of it, regardless of the availability of the ILS, would be most helpful to the airline pilots. It gives them a sense of orientation with the ground, which as you know is one of the most primary factors in aviation safety.

Mr. QUESADA. We are sure it would be helpful.

Mr. PYLE. Mr. Chairman, I think this brings up a point with which I concur, namely, we have got to give the pilot every possible assistance we possibly can. We are working on the evaluation of several devices which achieve this very objective to which you refer, but I think do it more practically and certainly less expensively. This is visual glide path indicator. You may well remember you and I discussed this. It is the English and Australians both who have developed these techniques. This is now being installed at Atlantic City. We are trying to evaluate that, which does the better job for the pilot. I think this is a simpler, quicker and more easily installed system and does the exact job to which you refer.

We hope to have this, as Mr. Quesada has pointed out. This is the highest priority. I personally am following this. I intend to go over and fly it as soon as we get some bad weather and try the systems out. We hope to have this evaluation completed this spring and the installations will start forthwith.

Senator MONRONEY. Are you holding up the installations on the present systems you know about? For example, the one which you have at the south end of Washington National? Are you holding up installations of these 54 that are programed for the final outcome of your research and development of another system?

Mr. QUESADA. There are no programed projects that are being held up awaiting evaluation of others. The system to which Mr. Pyle referred would be an addition to what we are already planning.

Senator MONRONEY. You have had two accidents at Midway involving cargo aircraft, I believe, this year, one American, and the other TWA. One was fatal not only to the crew but to some people on the ground and the other, I believe, the American, Convair, all escaped after it fell short of the runway.

This is, I think, the busiest airport. Maybe since O'Hare opened, it has been downgraded a bit. Midway, I believe, has no approach lighting, has it?

Mr. PYLE. Midway has approach lighting on runway 13. I believe it is 13 right. This is associated with the ILS approach system. The standard approach configuration with sequence flashes on the approach to the southeast; on runway 13. I believe it is 13 right.

Senator MONRONEY. St. Louis has a modern airport, Lambert Field, which has some approach lighting.

Mr. PYLE. Lambert Field has approach lights on the ILS runway. I fail to recall which runway that is.

Senator MONRONEY. These matters I believe deserve greater attention from the local airport authorities. If the laying of the hardtop and fixing of the ramps and other such things are given priority, by local management, because they may yield additional revenue, in contrast to the approach lighting, then I feel it is time for the FAA to get plenty tough on carrying out what we suggested in the 1958 report and that you tell them to do it or we will. If they continue to drag their feet, then proceed to close those runways which appear to be marginal under anything but visual landing conditions.

Mr. QUESADA. It certainly is encouraging to me, Senator, to find that you agree with the principle that we have adopted, that our Federal aid to airport money should be devoted to safety matters; safety projects. I certainly agree with you. I think it is incumbent upon those people to whom we grant the money to install the equipment with the least possible delay. In this year's program we were reluctant and did not give grants to people—to groups and communities, I should say—to groups and communities that did not have the funds available to be spent then and there. We took the philosophy that we matched their funds, rather than they match our funds. The objective of this was to get the equipment installed and bring aid and comfort to the public and the crews with the least possible delay.

Senator MONRONEY. Did we not provide in the Federal Airport Act, that you were to have the authority to put up the money necessary to install the whole system of approach lights and that the percentage of local costs would be charged back to them on some later grant, and that they would be compelled then to pay it or it would be withheld from future grants?

Mr. QUESADA. I don't understand the point of this, Senator.

We do have the authority to pay 75 percent of high intensity lighting, and we do it.

Senator MONRONEY. The other point is that you have the authority, under the provisions of the Federal Airport Act which was extended in its entirety this last year, to put up the additional 25 percent and then to charge that back to the airport at such time as they receive additional grants from you. This is the thing that I am saying, that you have the ability, and under this paragraph, which was carefully written into the report during the administration of Mr. Pyle, I believe it was, or perhaps his predecessor, Mr. Lowe, to completely pay out the whole cost and condemn, if necessary, the required land. At the time we wrote that in, the gist of the testimony was that one of the obstructions to a swift adoption of approach lighting was the fact

that too much local politics was being played; that certain constituents, important councilmen, aldermen and others, did not wish to have high intensity lighting shining in their bedroom windows. While I can appreciate that difficulty it certainly should not be a bar to the proper installation of this primary and very essential safety device.

Mr. QUESADA. Senator, we agree with you. We are accustomed to these influences to which you refer. Sometimes they are very frustrating, certainly to us as they obviously are to you. However, in the final analysis it is up to the community to install these facilities. Once they are installed they own them. It is up to them to take the initiative in installing these necessary safety devices. And it is up to us to administer the funds reasonably and to the best interests of all concerned.

Senator MONRONEY. Then you do have the power to raise the minimums?

Mr. QUESADA. We have the power to raise the minimums, and do it.

Senator MONRONEY. That is one device within your power where an obstinate and dilatory city council or airport authority fails to speed up or activate the proper safety devices such as approach lighting to facilitate and protect landing the planes. I gather that you can raise the minimums even to the point where you can bar the runway to anything but VFR.

Mr. QUESADA. We could do this.

Senator MONRONEY. Does that seem like an effective tool in getting off the dime and breaking the bottleneck where an airport is undergoing local political pressures?

Mr. QUESADA. We do this. It is a difficult thing to do, but we do it.

Senator MONRONEY. Are there any airports where you have done this?

Mr. QUESADA. In the process we have to adopt reasonable programs, but there are some cases that I would rather not get into because it would make my problem harder, certainly.

Senator MONRONEY. Be general. Let's try and get some approach lighting in.

Mr. QUESADA. There are some cases where we have difficulties with the community, and they are objecting, just as you have indicated, to the lights flashing on and off. It is a source of great concern and difficulty to us. I won't say annoying, but it certainly does not make our problem any easier, definitely. We have many cases where the community is objecting to the facilities that we put in, on the grounds that you suggested. And we do try to make reasonable safety regulations that are compatible with the facilities that do exist.

Senator MONRONEY. Senator Cotton?

Senator COTTON. I do not desire to resurrect the controversy that took place at the first session of this Congress, but it is my recollection that when we were discussing aid to airports, which is also within your jurisdiction, that it was your attitude during that discussion that while you were not enthusiastic about aid to waiting rooms and terminal facilities, that you were enthusiastic about making use of such funds as you have in contributing toward such things as safety lighting and other things that have to do with the safety of the users of the airport facility, is that correct?

Mr. QUESADA. That is absolutely correct, Senator Cotton.

Senator COTTON. Is it still your policy that if any airport anywhere in this country is interested in adding equipment such as lighting that is directly concerned with safety, that they will find, insofar as your funds permit, complete assistance and cooperation financially from you?

Mr. QUESADA. They definitely will. Assistance, material and technical assistance, we will give them. I would like to submit for the record in this respect our 1960 program that is now completed. It is now being implemented for the fiscal year 1960. I am sure this program will reflect that we are giving the highest priority to those devices that could be classified as devices in pursuit of public safety.

Senator MONRONEY. How many of these 54 approach lighting installations do you expect to be completed by the end of this fiscal year? You say they are programmed. How many will we get?

Mr. QUESADA. We will give you our programs right down to date.

Senator MONRONEY. We would like to know how many have been installed during the first 6 months of this fiscal year and how many will be completed.

Mr. QUESADA. We will give you a complete record of this. I haven't got it here, Senator. I will get it for you.

(The above-mentioned material follows:)

Short-range terminal area radars (sets the pilot upon the approach to the runway):

Installed as of June 30, 1959: 48, FAA; 54, military.

FAA has funds and has programed a total of 81.

Additional terminal area radars installed since June 30, 1959: None.

To be installed by end of fiscal year 1960: Two.

Balance due for installation by end of fiscal year 1961 (depending upon delivery of equipment): 32 (plus 3 more military).

Precision approach radars (helps the pilot to come down the slot):

Installed as of June 30, 1959: 10.

FAA has money and has programed a total of 23.

Additional PAR's installed since June 30, 1959: One.

Balance due for installation by end of fiscal year 1960: 12.

Senator MONRONEY. Another aid of vital assistance, aand perhaps one which would have helped to avert the Lockheed crash, is control approach radar. As I understand it, this man went off the radar after he made his turn for the final approach and there was no radar monitoring whatever at this very, very busy airport after he started his glide into the field.

Mr. QUESADA. There was no GCA on this particular runway. The rules, the operating rules, gave consideration to that. That is correct.

Senator MONRONEY. Do you mean that he had all of 400 feet and three-fourth of a mile visibility with a 4,900-foot runway, but no GCA on that runway?

Mr. QUESADA. There was no GCA on that runway.

Senator MONRONEY. You have GCA on the longer runways?

Mr. QUESADA. We have GCA on longer runways.

Senator MONRONEY. What is the length of that? About 7,500 feet?

Mr. PYLE. The precision approach radar is on runway 4. It is oriented in a reverse direction, on the same runway, 4,900 feet.

Senator MONRONEY. What were the wind conditions? Why did he have to land on the dark side?

Mr. QUESADA. The wind, if I recall correctly, was between 8 and 12 knots. We will get that exactly for you.

Senator MONRONEY. That would have been enough wind to have made a landing on the instrumented direction dangerous?

Mr. QUESADA. It would not have been reasonable to have landed downwind. Senator, there is one thing I think should be brought out——

Senator MONRONEY. Was the other runway closed at that time, the cross-wind runway?

Mr. PYLE. No.

Senator MONRONEY. Open?

Mr. QUESADA. It was open.

Mr. PYLE. To my knowledge.

Mr. QUESADA. There was no reason to close it, so far as we know.

Senator MONRONEY. It is closed now?

Mr. QUESADA. For structural reasons; yes.

It must be brought out, Senator, on the other end of the runway it has the ILS which I have described as a cone down which the pilot flies. On the back course all of the elements of ILS are there, except the elements of the gradient, that is the only element that is not there.

Senator MONRONEY. All he has is a homing point and he has to find his way in. Is that about 2 miles out?

Mr. QUESADA. He has more than a homing point. He has a homing point which is not a cone, it is a flat surface that gives him direction into the runway. The rules are written so that if he is at a certain point, at a certain altitude, he is on the glide path and he is not allowed to go below the 400 feet unless he sees the runway. I want to make sure that you understand that if he went to 300 feet, without seeing the runway, he was not conforming to the pattern that was prescribed for approaching that runway.

Senator MONRONEY. Here again, he must read his altimeter—it was erroneously set, but it would have still forgiven him that mistake had we had very inexpensive and readily available high-intensity approach lighting.

Mr. QUESADA. The answer is "Yes."

Senator MONRONEY. Then is it necessary, because it interferes with navigation, to have Federal legislation to either close Rikers Channel to navigation for the installation of this approach lighting, or to close the runway?

This is a point I would like to know. I think something has got to be done. This is the only runway open at LaGuardia today. Certainly from the evidence that we have heard here, I for one do not want to make an instrument approach on runway 22, and yet I never know what runway I am going into as I fly. I am sure there are literally hundreds of thousands of people, if they had knowledge of the conditions that exist, that would not like to make it, either.

Mr. QUESADA. The closing of Rikers Channel would be an impossible thing for us to do.

Senator MONRONEY. But Congress has control of navigable waters. Congress is now in session. Unless that runway has the proper instrumentation and visual aids, I think it would be a choice of one or the other, either close the runway or close the channel, if that is going to be what is necessary.

Mr. QUESADA. Certainly, Senator, you would not find any objections from me or the Agency that I head to any legislation that gave to anybody—I am not necessarily saying it should be our power—the ability to bring solution to these problems.

Senator MONRONEY. We need to break a bottleneck here.

Mr. QUESADA. There is a bottleneck.

Senator MONRONEY. You have control of air space. You don't have control of sea space. Since this is largely a barge channel, I am sure the huge steamships don't use this channel——

Mr. QUESADA. It is a pretty busy barge channel.

Senator MONRONEY. It would be possible, would it not, to build a lightweight bridge to permit navigation beneath these approach lights? Some of them out a ways get rather high, do they not?

Mr. QUESADA. We would have been willing to put our approach lights on any reasonable structure that the community saw fit to build.

Senator MONORONEY. I have heard rumors that the very captain who was killed in this accident had himself installed some kind of lights just by his own work on the end of that runway. I have heard that reported a number of times.

Mr. QUESADA. I am not familiar with it.

Senator MONRONEY. And that it was torn down by the navigation people.

Mr. QUESADA. I am not familiar with this. If it is true, I would certainly like to know it, because if it is true we would like to publish it so other pilots would know it. Furthermore, so they won't get confused by one man's system.

Senator MONRONEY. Apparently he felt he needed it. Every pilot I have talked to who made that landing over that dark hole feels that something is needed.

Mr. QUESADA. I am not familiar with any installation that this pilot is reported to have made.

Senator MONRONEY. I don't believe it remained very long. I believe it was torn down shortly. This was an effort of private enterprise, you might say, to seek safety.

Mr. QUESADA. I hope it was effective.

Senator MONRONEY. In these two accidents where the two cargo planes went in, at Chicago Midway, were they on approach lighted runways?

Mr. PYLE. Mr. Chairman, the American Airlines Convair accident, to which you referred, was an approach on runway 31, which does not have approach lights?

Senator MONRONEY. This was at midnight or shortly thereafter, as I recall, under very close tolerance on the ceiling there.

Mr. PYLE. I would have to familiarize myself with that.

Senator MONRONEY. This is already reported by the CAB?

Mr. PYLE. That is correct. It occurred at 53 minutes after midnight.

Senator MONRONEY. While we are on that, it was developed yesterday that there is a different ceiling that FAA has for cargo planes and for passenger planes. I think it might be a good time to ask why, since ground safety and pilot safety is involved. Why, in the same general type of aircraft, is this difference of, 100 feet permitted?

Mr. PUTNAM. The difference is that the cargo aircraft are not carrying passengers, and they are permitted to land at 100 feet less ceiling and one-quarter mile less visibility than with passengers.

Senator MONRONEY. You are restating what I said. I am asking why is an airplane more safe—and I presume that is what the safety regulations are for—if it is carrying cargo instead of people? In other words, you permit a 100-foot ceiling tolerance and a quarter mile less visibility. The people on the ground are in the same potential danger and likewise the pilots in the cockpit. If it is spun in out of control on the runway, where a 100-passenger plane is waiting for a takeoff, the exposure there is obvious.

It seems to me that you can't make fish out of one and fowl out of the other. If the safety regulations require 400 feet and a mile visibility for a passenger aircraft, whether it has 10 people in it or 50 people, then the same safety tolerances should be required of a cargo plane even if it is carrying only two able and competent pilots. The same people are living there underneath that approach.

Mr. PUTNAM. The airplane making the approach meets the same obstruction criteria, persons, and property on the ground, as any other aircraft. This minimum simply permits the airplane to approach to a lower altitude without coming into contact with the ground than it would with passengers. The main safety margin lies in the fact that the basic problem is a man making the transition from flight by reference to instruments to visual reference with the ground.

The passenger-carrying aircraft are provided with a greater margin of time for the pilot to make this transition than the cargo pilot. This does not contemplate that the pilot will miss the airport and undershoot, as the man at Chicago did.

Senator MONRONEY. As two men at Chicago did.

Mr. PUTNAM. Yes, sir.

The point being, in this particular case, the man simply extended below his authorized path and he just wasn't where he thought he was.

Senator MONRONEY. The TWA crash was a return with an engine out. But the other plane was dispatched out of Detroit, if I recall, under very marginal ceilings, and it chose to come in under that marginal ceiling at 300 feet, which was permitted under the different regulations there, and resulted in the crash. Fortunately I believe everybody walked away from it. But had it fallen on the other side of the field, you could have had a recurrence of carnage to people on the ground. He was coming in over the railroad tracks there so he fell into railroad cars instead of houses. But I can not square in my own mind any margin of safety that the plane or the engine or the pilot or anyone else is supposed to have simply because there are packages of goods in the plane instead of passengers.

Mr. PUTNAM. I see what you mean. I think the basic point goes back to the fact that these reduced minimums permit greater flexibility of cargo operation, but the main protection has been given to passengers and not with regard to persons in the approached area.

Senator MONRONEY. But the pilots are people, too.

Mr. QUESADA. Sir, I think two things should be brought out. In this particular case to which you are referring, and it is the American Airlines Convair, the pilot, in fact, struck the ground 3,750 feet from the end of the runway. At that point, and at all other points, he was

not allowed to be below 300 feet. So he had to be below 300 feet at some distance greater than 3,800 feet.

Senator MONRONEY. I understand that.

Mr. QUESADA. I realize that lights might have avoided this. I agree with that. But we are putting the lights in as fast as we can, as fast as money can be appropriated for it, as fast as we can buy them and install them.

The second point is, we are reevaluating all of our procedures. Some of these are of long, long standing. We have new types of aircraft. This is one of the procedures that is now undergoing reconsideration.

Senator MONRONEY. You are going to study whether there is a legitimate reason for a safety differential between——

Mr. QUESADA. Yes, sir.

Senator MONRONEY. I hope you will give that very careful study because, for the life of me, I cannot see why the safety rules, excepting for the number of people involved, are applied differently with the same type of aircraft and on the same runway when it is carrying packages rather than people. As much as I believe in promoting air cargo, I don't believe in it to the extent that we should compromise with safety for the economic reason that freight must go through regardless.

This is something that is surprising to me, that there are two sets of safety standards—one for the cargo plane, and the other for the passenger plane. You make no difference as to the condition of the plane before clearance do you?

Mr. QUESADA. No, sir.

Senator MONRONEY. Only in the minimums that are permissible.

Mr. PUTNAM. Yes, sir.

Senator MONRONEY. Are there any other accidents that were related to landings?

Mr. PUTNAM. The next one involves Southeast Airlines at Bristol, Tenn. The airplane was going from Nashville, Tenn., to the Tri-City Airport at Bristol. The pilot left Nashville with an inoperative automatic direction finding radio that was required for the flight. On the way he encountered heavy cross winds.

He did not actually get to the places he reported. He missed on his procedure completely and landed in the hills east of the airport by a considerable distance. There were 10 people killed, 7 passengers and a crew of 3.

Incidentally the copilot was in the pilot seat.

Senator MONRONEY. This, as I understand it, was not an interstate carrier, but one that was intrastate, is that correct?

Mr. PUTNAM. Yes, sir.

Senator MONRONEY. Which is under your jurisdiction. Is it required to meet the same safety standards?

Mr. QUESADA. The same safety standards are required.

Mr. PUTNAM. The second one was the General Airways' accident——

Senator MONRONEY. This plane was not in the immediate vicinity of the airport. The pilot failed to find the airport in its entirety, is that not correct?

Mr. PUTNAM. He struck at a point some 10 miles or more east of the airport.

Senator MONRONEY. This doesn't involve the particular question that I am talking about, then.

Mr. QUESADA. He missed by such a wide margin that your point is not appropriate.

Senator MONRONEY. That is not appropriate to the line of inquiry on the landing hazards that I am trying to explore.

Mr. QUESADA. It is important for it to be understood that he failed to follow the standard and specified approach procedures. That is important.

Senator MONRONEY. But he couldn't very well if his automatic direction finder was out?

Mr. QUESADA. That is correct.

Senator MONRONEY. This involves a fault of maintenance, which I think we should hear more about. You were quite properly indignant at some of the maintenance problems in your statement yesterday. I certainly compliment you for the speed with which you moved to try to correct some of these deficiencies.

Mr. QUESADA. Senator, it must be brought out, in order to understand the maintenance problem, which is certainly a problem deserving of your continued consideration, that a prudent pilot gives consideration to the facts that he knows. If he knows his direction finder, so to speak, is out, that is a condition that is factual at that time. And it should be expected that he would respond accordingly.

Senator MONRONEY. The Allegheny crash at Williamsport, are you prepared to say anything about that? I know the CAB investigation has not been completed. This was in the approach area of the airport, I believe, that this wreck occurred.

You might sketch at least the known facts there, without speculation or revealing anything that hadn't been proven as yet in your study.

Mr. QUESADA. As we have said, we do investigate with the CAB with a view to applying any corrective measures that might be appropriate prior to the determination of probable cause. As you have cited, the CAB has not determined probable cause. We would only give factual data as we saw it, and are prepared to do so.

Mr. PUTNAM. We have found nothing wrong with the Williamsport approach as yet, Senator. The approach was perfectly normal, the airplane was seen in the vicinity of the airport. He made a turn of nearly 270°, and headed off to the south where he struck the mountain. We found nothing wrong with the aircraft or anything wrong with the facilities. He did not follow the correct procedure.

He should have called up and reversed his course.

Mr. PYLE. Mr. Chairman, so there is no misunderstanding, Mr. Putnam's point was that the initial approach seemed to be in order and was according to procedure. Where the trouble started was where he did not follow his correct missed approach procedure.

Senator MONRONEY. He went past the point where he was to turn one way and turned the other way?

Mr. QUESADA. Instead of turning right he turned left.

Senator MONRONEY. You have checked the radio beams and all and found they were in proper working order and no defects were there?

Mr. QUESADA. After every accident of this kind we immediately, among other things, check the facilities that are provided to bring aid and comfort to the crew and the public. In this particular case there was no fault found with the facilities. We must tell you that we have separated these functions so that this appraisal can be of a detached character.

The people who are operating the system, our traffic control people who use this equipment, they don't do the checking.

We have separated these procedures so that we are applying to ourselves the same procedures that we apply to the airlines, the airline pilots, and to others.

Senator SMATHERS. Mr. Chairman, are you through with that. I have a question.

Senator MONRONEY. On the same accident?

Senator SMATHERS. No.

Senator MONRONEY. We are on the approach problem.

So far as you know these are all the things that you can say about the Williamsport accident at this time, prior to the official findings of fact?

Mr. QUESADA. That is about all.

Senator MONRONEY. Incidentally, since you were not here at the time on some of these, where the investigations are still tentative and leads have not been followed out, we will go into an executive session rather than to take half-truths or speculation and maybe go off on a wrong trail.

This is really a detective job that has to be done to ascertain all of the facts. Some of the obvious facts that you may be working on that seem reasonably contributory to the accident we would like to have in executive session so that we can ascertain if any immediate steps need to be taken.

On this Williamsport accident, did the pilot have the airport in sight?

Mr. PUTNAM. I can't testify to that.

Senator MONRONEY. There were snow conditions, flurries of snow, as I understand?

Mr. PUTNAM. The facts that we have are that the ground people saw the aircraft, but we have no way of knowing whether the pilot saw it or not.

Mr. QUESADA. In other words, people on the airport saw the airplane, but we can't testify to the fact that the pilot in the airplane saw the airport.

Senator MONRONEY. The preliminary report of December 1, by the CAB investigators, is that the weather at Williamsport was 1,000 feet scattered precipitation, ceiling 2,000 feet; obscuration, visibility 1½ miles. Light snow, wind west 4 miles. Would that indicate that at the altitude the plane was approaching—what would have been his altitude?

Mr. QUESADA. Under those conditions it should be normal to assume—however, I would like to accent this is an assumption—that he would have seen the airport. This is an assumption.

Senator MONRONEY. This is a regularly scheduled landing for the plane?

Mr. PYLE. Yes, sir.

Senator MONRONEY. Does this airport have high intensity approach lighting?

Mr. PYLE. It does not.

Senator MONRONEY. Does it have ILS?

Mr. PYLE. It does not.

Senator MONRONEY. This was strictly a visual approach then?

Mr. PYLE. It is a low frequency approach with high minimums because of that factor plus the surrounding terrain.

Senator MONRONEY. What were the minimums?

Mr. PYLE. We will have to furnish that for the record.

Senator MONRONEY. In your judgment, under that set of weather conditions, had there been modern approach lighting, would the pilot have been better able to find the airport and to effect his landing instead of crashing?

Mr. QUESADA. I think it should be brought out that this occurred in daylight. But I think a forthright answer to your question is that lighting would have helped had it been turned on. I think all of these things will help.

Senator MONRONEY. That is what I am saying. This is the extra margin that forgives error in piloting or a failure to observe proper flight procedures. Visual aids make up for an awful lot of things when you can see where you are going.

Mr. PYLE. Mr. Chairman, the minimums are 1,500 feet and one mile at Williamsport.

Senator MONRONEY. Then if he had a thousand feet scattered he was under minimums at that time. Or is scattered considered——

Mr. PYLE. Scattered is not included. Two-thousand-foot overcast would be the minimums in that case.

Senator MONRONEY. Precipitation, ceiling, 2,000 feet, what does that mean?

Mr. PUTNAM. It means that there was rain falling, and as far as they could see up into the sky, it was 2,000 feet. In other words the pilot flying 2,000 feet should be able to see the ground. There was not a distinct cloud deck in the ordinary sense of the word. The scattered clouds do not constitute a ceiling. Scattered clouds are less than one-tenth coverage.

Senator MONRONEY. Do you have a question now, Senator? I am through on this particular line.

Senator SMATHERS. You go ahead.

Senator MONRONEY. On the Charlottesville accident where the pilot apparently had an accident I believe south of his course——

Mr. PUTNAM. That has not been released by the Board either.

Senator MONRONEY. I wonder what the preliminary findings are, of the weather conditions, and whether the pilot could have had the airport in sight?

Mr. QUESADA. Which case is that?

Senator MONRONEY. Charlottesville.

Mr. PUTNAM. That airplane, relying on memory, was bound for Charlottesville and reported over an intersection, at which point he was clear to descend to an airport. He had a broken——

Senator MONRONEY. Would that be five miles out?

Mr. PUTNAM. No, some 18 miles out at this point. He should have homed on a radio compass located just south of the airport, just beyond the airport, before him. He descended to an altitude which should have made him just at the base of these broken clouds. From there he should have continued some 18 miles south to the company-operated homer, radio homer, continued on ahead, made a procedure turn to the left, and come back to the airport. He was found at a point some 15 miles west of the airport. We have no explanation yet as to how he got there.

Senator MONRONEY. Was the weather such that he could have had the airport in sight at the altitude from which he would normally be descending?

Mr. PUTNAM. It is a good question——

Senator MONRONEY. Was the weather or ceiling such that under his normal descent he would have had the airport in sight had he been on course?

Mr. PUTNAM. Yes, sir. The actual weather was well above minimums, far above his minimums.

Mr. QUESADA. We will get for you what the minimums are, and what the weather was at the time.

Mr. PUTNAM. Straight-in approach was 400 feet and one mile.

Mr. QUESADA. What was the weather?

Mr. PUTNAM. I will have to get it.

Mr. QUESADA. We will get the weather for you at the time.

Senator MONRONEY. Were there any other accidents that you recall that had to do with missed approaches or cases involving planes lost in landing procedures?

Mr. QUESADA. Fatal or nonfatal?

Senator MONRONEY. Both.

Mr. PUTNAM. General Airways was involved in an approach down in Texas. That has been released by the Board. Do you want to continue with a discussion of that?

Senator MONRONEY. Briefly, yes. Was that nonfatal?

Mr. PUTNAM. No, sir, fatal. This was a military contract operation flight. He was headed for San Antonio and en route ran into severe icing conditions and ran out of fuel. The FAA traffic controllers arranged to have a local company-owned radio homer owned by Trans-Texas Airlines turned on, and the lights for the airport turned on. The pilot ran out of gas before he completed his approach.

Senator MONRONEY. You are getting a little ahead. This man was destined to another airport?

Mr. PUTNAM. Yes, sir.

Senator MONRONEY. He ran into icing conditions. His gas was low. He put in an emergency call, I presume, to the nearest tower, notifying them of his predicament, and this then happened, that Trans-Texas had their homer radio turned on and the lights turned on at Kerrville, Tex.?

Mr. PUTNAM. Yes, sir.

Senator MONRONEY. This is in the mountains down there, is it not?

Mr. PUTNAM. Hilly country, yes.

Senator MONRONEY. Proceed.

Mr. PUTNAM. He just ran out of gas and landed in the darkness out there in the hills. One pilot and one passenger were killed.

Senator MONRONEY. This was not in connection with a normal landing under proper power or under normal conditions?

Mr. PUTNAM. No, sir. His fuel was exhausted.

Senator SMATHERS. Mr. Chairman, is it all right—a moment ago when I came in you were talking about maintenance matters. I hope I didn't miss that part.

Senator MONRONEY. We have been dwelling at the moment on what could be done to improve ground orientation through high-intensity lighting and other ground aids which are lacking on so many of our airports.

If you would hold that until we see if there are any other accidents that are associated with landing procedures, we will get to that.

Mr. PUTNAM. There are quite a few of them. Very few were fatal. There was one at Charleston, W. Va., involving two fatalities, which the Board has not yet released.

This was a Capital Airlines Constellation.

Senator MONRONEY. That Charleston, W. Va., accident you are talking about was Capital Airlines aircraft L–049 on the 12th of June 1959, I believe.

Mr. PUTNAM. Yes, sir.

Senator MONRONEY. It is listed as an overshot on landing.

Mr. PUTNAM. Yes, sir. The airplane made an approach to the Charleston Airport. The runway was wet. He landed within the reasonable limits of the length of the airplane and was unable to stop it. He attempted to ground loop it before reaching the end of the runway, but was not successful in doing it and slid off the runway to one side.

Senator MONRONEY. He went over the side of the mountain. That would be running north-south. At Charleston, W. Va., you go down the side of the mountain; don't you?

Mr. PUTNAM. He was landing toward the northwest.

Senator MONRONEY. Is there evidence that he missed his approach or anything?

Mr. PUTNAM. No, sir. It was a circling approach. As far as we can tell the approach to the landing was perfectly normal. He was above his weather minimums.

On June 12 a National Airlines flight approaching Norfolk, Va., landed approximately 25 feet short of the airport. The wheels struck the curbing at the end of the runway. The airplane bounced, blew four tires, and suffered substantial damage to the aircraft, but there were no injuries. We believe that the copilot was flying this particular airplane.

Senator MONRONEY. What date is that? We are trying to relate this to the CAB report.

Senator SMATHERS. June 12.

Mr. PUTNAM. Which one is that, Senator?

Senator SMATHERS. June 12.

Mr. PYLE. It is possible, Mr. Chairman, that because there were no injuries to either crew or passengers, that this was not included.

Senator MONRONEY. This is listed as nonfatal accident.

Mr. QUESADA. Nonfatal, noninjurious. Nobody was hurt. But it was classified as an accident because the damage to the aircraft determines whether it is an accident, plus damage to personnel, too.

Senator MONRONEY. Were there low ceilings or limited visibility?

Mr. PUTNAM. No, sir.

Senator MONRONEY. Airport clearly in sight under VFR?

Mr. PUTNAM. Yes, sir.

Senator SMATHERS. How much damage does the plane have to sustain before it is listed as an accident?

Mr. PUTNAM. One hundred dollars or major damage to a a component. The $100 usually applies to such things as a bent propellor or to straighten wing tips, something of that sort, if it costs more than $100 to fix.

Mr. QUESADA. I would like to bring out, Senator, in the Charleston accident the pilot was not held in violation of any rule.

Senator MONRONEY. Was it brake failure?

Mr. PUTNAM. No, sir. He undershot.

Mr. QUESADA. This is Charleston.

Senator SMATHERS. Overshot.

Mr. PUTNAM. I beg your pardon.

Senator MONRONEY. I gather from what you said it was a slippery runway, and the brakes either didn't hold or his props wouldn't reverse.

Mr. QUESADA. I wouldn't attribute it to overshooting because the runways were wet. These are circumstances that contributed to going over the end. There was no violation involved.

Mr. PUTNAM. The runway was of ample length for normal operation of the airplane at Charleston.

Senator MONRONEY. Were there any others that you recall related to approach accidents?

Mr. PUTNAM. We have a number of undershoots and missing the runway, things like that, which were not fatal.

On August 29 a Northeast Airlines Viscount landed on the left side of the runway following a normal ILS approach. The No. 2 propeller struck two runway lights and two blades were damaged. The precision radar indicates the aircraft drifted to the right of course after passing the middle marker. There were no injuries in this particular accident, just minor damage.

Senator MONRONEY. No weather complications?

Mr. PUTNAM. No, sir.

Senator MONRONEY. What research do we need for better orientation to the airport? I wonder if there are any other incidents you recall of marginal weather conditions, where additional facilities might have helped to prevent the accident.

Mr. PUTNAM. When you mention lack of facilities, Senator, the approach procedures and the minimums are predicated on the facilities that are available. And the absence of any of these considerations requires that the minimums be raised. For example, with a complete ILS system the minimums may go down as low as 250 feet. If one element of the approach system is inoperative, the minimums are raised.

Each individual procedure is predicated on two factors, one is the obstruction clearance that is necessary to avoid all obstructions in the area. The second one is predicated on the facilities that are available.

Senator MONRONEY. That would be the runway length, the approach glide——

Mr. PUTNAM. Navigation aid, the lighting and the obstructions in the area. Plus any peculiar errors that the radio aid may have.

Senator MONRONEY. You mentioned, General, that you had programed 54 high-intensity approach lighting systems. How is the installation of approach radar going?

Mr. QUESADA. Senator, you are making the point, legitimately and properly, to which we agree, that facilities will always contribute to the avoidance of accidents. In the current fiscal year there has been appropriated approximately $145 million to acquire and install these facilities. We think we have a reasonable program to provide the facilities to which you refer and which you say are essential and which we say are essential. In respect to approach lighting—I mean surveillance radars—I will have the office call to inquire how many radar approach systems are in the 1960 budget.

Senator MONRONEY. Could we have how many approach systems, radar approach systems we had at the beginning of the fiscal year? How many we have installed now and how many you expect to have installed at the end of this fiscal year?

Mr. QUESADA. Right.

Senator MONRONEY. Include military systems which have been made available to you, too. I think that is a figure we would like to have. I understand numerous airports, where before the FAA you had no use of the military approach radar, that where they have adjacent fields that are so equipped today, you are given that help and assistance by military radar.

Mr. QUESADA. This is focusing on approach radar?

Senator MONRONEY. Yes. While you are at it, while this is not the immediate landing subject, on the other air traffic control radar, you might give that, and separate the two. It would be well to have both of those figures.

Mr. QUESADA. We can give you the whole facilities program.

Senator MONRONEY. We would like to have particularly these two features or any other data that you feel will contribute to our aid. The public is entitled to know what is going on and whether the money has been appropriated; as you say $145 million is being spent with all due speed and reference to its immediate installation.

Senator MONRONEY. Senator Smathers, do you want to start on the maintenance features?

Senator SMATHERS. Yes.

General, what sort of maintenance standards have you people set for the ordinary air carrier? Not the private carrier but the ordinary air carrier?

Mr. QUESADA. The quickest way to answer it would be to say high maintenance standards.

Senator SMATHERS. Would you give us some illustration of what you mean by high?

Mr. QUESADA. The plane must be in airworthy condition in every respect.

Senator SMATHERS. How do you know that? How do you determine it is before it goes out on a flight?

Mr. QUESADA. We don't determine it on every particular flight. That would be a physical impossibility. We have to count on the company doing its share. The law says that the company shall maintain at the highest possible standard of safety.

Senator SMATHERS. If the company traffic manager gets torn between a desire to carry a load which would mean a lot of money for him on a particular day, and the service manager is torn between the desire maybe to test the plane, who usually wins out in that kind of situation?

Mr. QUESADA. I would hope that that factor of the company that wishes to test it.

Senator SMATHERS. Then it is possible for companies to have varying standards of testing for maintenance if you leave it to the companies?

Mr. QUESADA. We prescribe standards up to which they must come. I am sure the various companies do have carrying standards of maintenance. I think it is unreasonable to say otherwise. Like people are different, I think companies are different.

Senator SMATHERS. That is right. Do you have any illustration where some company has not maintained the high standards you wish they would, and require in effect that they do? Do you have any illustrations?

Mr. QUESADA. Yes. As I indicated in my statement, we have in our enforcement program on a number of occasions, an all too high number of occasions, found that they were not meeting the standards, and we imposed a penalty upon them. In some cases, in many cases, to the extent of $1,000. In other cases, as I have indicated, we have taken teams and sent them right to the company and analyzed in the greatest of detail the maintenance practices and standards that they were keeping. As I indicated in my statement, in one particular case, with a major carrier, we insisted that some major changes be taken in their maintenance practices. And it resulted in a material reorganization of their maintenance departments.

We have another one underway at this moment. In some cases we have called management in and brought to their attention the deficiencies that we saw existed.

Senator SMATHERS. How frequently do you make these checks on these air carriers as to whether or not their maintenance standards are up to what you would consider par?

Mr. QUESADA. We are constantly making the checks. Admittedly we can't perform every function that they perform. Our check primarily is to see if they have the necessary mechanism to perform their functions. When they don't, we take steps to assure the public that they do.

In the process of this, if we find particular violations, or particular areas where they should have done something that they are not doing, or vice versa, we take steps then and there to correct it. And in many cases this results in a penalty.

Senator SMATHERS. Would you care——

Mr. QUESADA. Perhaps not as severe as it might be.

Senator SMATHERS. Would you care to——

Mr. QUESADA. Maybe Mr. Pyle could comment on this further.

Senator SMATHERS. All right.

Mr. PYLE. To supplement what Mr. Quesada said, we have air carrier maintenance inspectors assigned to each carrier. It is their responsibility to carry out the procedures to which Mr. Quesada referred.

Further, if we find specific deficiences or a trend or tendency that indicates an unhealthy condition, we send a special team. This is done periodically.

Senator SMATHERS. For each carrier we will say at Miami or Oklahoma City, there is an FAA inspector assigned to that carrier to see that the maintenance standards are kept, is that correct?

Mr. PYLE. They are assigned at the headquarters of the company or the main maintenance overhaul base. Is that correct?

Mr. PUTNAM. Yes.

Senator SMATHERS. There is one to each carrier?

Mr. PYLE. Several to each. Depending on the size and extent of the operation.

Senator SMATHERS. How long do you allow these inspectors to stay with that particular carrier?

Mr. QUESADA. This brings up a very interesting point.

Senator SMATHERS. That is why I asked.

Mr. QUESADA. As a matter of practice in the past if you asked me, they have stayed there too long. We are taking steps, and have taken steps, to assure that there is a movement of these people from carrier to carrier.

Senator SMATHERS. It was a fact, was it not, that some of these inspectors would stay with one company and in one area for a period of possibly 5 or 6 years on some occasions?

Mr. QUESADA. That was a fact, and our corrective measures don't make me popular, I assure you, with the personnel in some cases. That is my point. They don't want to be moved. This is a very difficult problem to get through from time to time.

Senator SMATHERS. It is your conclusion, however, that if you leave an inspector with one company in the friendly surroundings of one group of people with whom he has long associated, that his inspection gets less intense? Has that been your observation?

Mr. QUESADA. I don't want to impugn our inspectors, but I do want to give consideration to human nature. This is a general tendency of human nature, and we have taken steps to try to overcome it.

Senator SMATHERS. For a specific question, for a moment, there was a story in one of the Florida papers regarding the accident which recently occurred with the National Airlines plane over North Carolina, that that plane had actually been used and was being used, before it was put into service that night, as the check-out plane for the pilots. Do you have any information on that particular allegation?

Mr. QUESADA. Senator, I am aware of this event on the part of this group of National Airline pilots. I am aware of the assertions that they have made. I have received a telegram from them that I would like to put into the record, and I would like to talk at some length on it if I may.

This telegram goes to the core of much of what I said in my statement.

The telegram referred to an ultimatum received today by the carrier from the FAA. I will say categorically we did not issue an ulti-

matum to this group. This goes right to the point of many of my remarks of the other day.

I would like to describe to the committee as articulately as I know how the point that they are attempting to raise, and in my opinion are bringing a disservice to the airline, to the FAA, and to the public.

This is a model of an airplane. When it is in this position it will fall, just like that. It has the qualities of a rock; and nothing more. It will fall 16 feet the first second, and increase 32 feet per second per second thereafter.

As you move air across these wings, or as you cause this machine to be propelled through the air, it eventually and gradually assumes aerodynamic qualities, and eventually this airplane can be made to respond to your demands. You can make it go up, or down. And this particular model can eventually reach a speed of around 600 miles an hour.

These people are charging, and improperly, that we are causing them to put this airplane into a position that causes it to buffet. This is a somewhat technical term, and I will try to be as untechnical as possible in the explanation.

When this airplane is static, it has the qualities of a rock. When it is moving at high speed, it is very responsive to one's will. It will do what you tell it to do.

At some time between zero speed and high speed there is clearly a twilight zone. It must go from the rock to aerodynamic, and it doesn't do it abruptly.

There are three stages that are in this so-called twilight zone. One is approach to stall, meaning that this airplane is going so slowly that it is beginning to not be responsive to the flow of air across the wings and surfaces. Eventually it goes to a lesser speed and goes to stall. Under those conditions the airplane is beginning to be nonresponsive.

I might say here that when you land an airplane, if it is a conventional gear with a tail wheel, what you are really doing is stalling and you hope that you are 6 feet or a foot above the ground, and at that point you fall out of the air. That is basically what a landing is. You have been able to be sufficiently articulate in the manipulation of this airplane, using the aerodynamic qualities which cause it to be responsive to your demand, that eventually it stalls and falls out of the air. You couldn't do this close to the ground.

If you want to go further you can pull it up into a lesser speed and then the air flow is burbling and doing other things and a large airplane sometimes will shake, which is in effect the buffet.

I want to say categorically, sir, that we have never required any airplane pilot, National Airlines or elsewhere, to cause an airplane to buffet severely as a demonstration of his ability to determine stall.

We do require them to fly the airplane to a speed slow enough to determine stall.

I also want to say to the committee in as clear terms as I know how to use, that if a pilot in the process of determining stall or demonstrating his ability to determine stall, is such a bad pilot that he goes through buffet and goes to stall, he is disqualified. If a pilot causes his airplane to buffet in the process of determining his ability to establish stall, he is certainly a disqualified pilot, because he is unable to

recognize the very essence of pilot skill; I don't know of a single case where this has happened. They are better than this.

Senator SMATHERS. General, may I ask you a question to clarify my own understanding, as you talked. When these pilots are required to take these tests, about which you have been making reference, is there an FAA inspector with them at that time?

Mr. QUESADA. I would like to bring up this point. In the first place, it is the company that conducts most of these tests. I would like to bring to your attention, in this particular case, the vice president of operations brought this out to the public, that it was the company that gives these tests. We give a few of them. We give some of them, you see.

Senator SMATHERS. Do you set, does the FAA set the standard or the questions that must be resolved or does each company have its own set of tests?

Mr. QUESADA. We set the standard and we will read it to you.

Senator SMATHERS. Don't read it.

Mr. QUESADA. The answer is that we set the standard.

Senator SMATHERS. So that the National Airline pilots were being put through these tests, or are periodically put through these tests which are prepared by the FAA. But the only observer of how these pilots pass these tests is the company man?

Mr. QUESADA. In those cases where the company is conducting the test. They have qualified people that we have designated as those who may give qualifying tests to the pilots.

Senator SMATHERS. Those are usually some of the senior pilots, somebody of that nature in that company?

Mr. QUESADA. That is correct.

Senator SMATHERS. Do you ever regularly yourselves have one of your men ride with these pilots to determine how well they pass these tests?

Mr. QUESADA. First, as a matter of not necessarily rule but practice, we conduct 20 percent of the tests—observe 20 percent of the tests.

Senator SMATHERS. With every company?

Mr. QUESADA. With every company, that is correct.

Senator SMATHERS. With every group of pilots?

Mr. QUESADA. That is correct.

Senator SMATHERS. Then 80 percent of them are conducted by the company itself?

Mr. QUESADA. That is correct.

Senator SMATHERS. Apparently what the National Airline pilots are claiming is that in the conduct of these tests that it damages the structure of the airplane?

Mr. QUESADA. They are claiming that, and I am saying it is untrue.

Senator SMATHERS. Let me ask you this question, which I asked you at the outset, which may or may not be evidence either way.

Was that plane which crashed in North Carolina, from New York, a plane that was customarily used to conduct these tests?

Mr. QUESADA. I am informed by the company that this airplane had not been used for test purposes for the previous 6 months, and they hadn't gone through their records beyond 6 months. The accuracy of this would have to be confirmed by the company.

Senator SMATHERS. Is it cutomary for the company to use one specific plane for the conduct of these pilot tests? Or do they just use any plane that may not happen to be in use at that time?

Mr. QUESADA. As a general rule, Senator, I think the companies use their whole fleet, as a general rule, for the conduct of tests. There might be some isolated cases where they have aircraft set aside for test purposes alone. However, I want to say again that the tests that we prescribe, and as far as we know the tests that they conduct, impose no strain on the airplane.

Senator SMATHERS. In the conduct of these tests do these planes from time to time actually go into a stall, where they have to nose them down rather severely to get as you say the air flowing back over the airfoils and one thing or another to give them control?

Mr. QUESADA. Sir, that imposes no strain on the airplane beyond the limits for which it is designed.

I will guarantee this. I will take any or all members of the committee out on an airplane and do it for them. I will put a g meter in it and also do it. If they go to buffet, which would be a clear demonstration that they can't recognize stall, and would in itself be disqualifying, that is another thing.

Senator SMATHERS. If they do buffet, and the pilot for National—to use them as an illustration—says, "Young man, you haven't done this very well, we are not going to let you fly for a couple of weeks until you improve your proficiency," how about that plane which has been buffeted? Has that plane been injured by the buffeting and what steps, if any, are taken to see that that plane which did buffet is then safe?

Mr. QUESADA. The airplane is always subject to inspection. It has a daily inspection, it has weekly inspections, monthly inspections, as a routine, to determine the airworthiness of an airplane.

A buffet, it would be quite unusual that a buffet causes damage. However, it has caused damage. I must, in order that I can assure understanding on the part of the committee, in certifying an airplane for worthiness on an initial certificate, which is done by another group of people, which in effect are test pilots—and this is confined to the prototype—we buffet the hell out of an airplane. We just shake it a lot.

I was in the flight test section at Wright Field. This is not an uncommon practice to me that I am familiar with. Under those circumstances the airplane is caused to buffet. That airplane is a prototype, which for all practical purposes is a flying laboratory. That airplane is not put into service.

Senator SMATHERS. What I am concerned about, among other things, to follow this on a little further, what happens when a plane goes through very severe turbulence, we will say, en route from New York to Oklahoma City. We will switch to California, as long as we are talking about turbulence.

Is it not possible for that severe turbulence to somehow affect the structure of the aircraft?

Mr. QUESADA. Definitely it is.

Senator SMATHERS. What is the ordinary procedure for determining whether or not that aircraft has been damaged by turbulence?

Mr. QUESADA. I would say that if the pilot reports that he has been in severe turbulence, that it would be prudent for the company—and I think they do—to make certain inspections to see if the turbulence, to which reference has been made, has brought structural damage.

Mr. PYLE. Senator, perhaps I can supplement this from an actual observation of many aircraft logs. Any time a pilot goes through an area of severe turbulence, he writes down this fact. This immediately grounds the airplane until someone can look at it and inspect it minutely to ascertain if any damage whatsoever has been done to the structure. It is not released for scheduled service until a mechanic indicates and signs it off as being okay.

Senator SMATHERS. Does that actually happen in every instance where the pilot writes that this plane has been through severe turbulence?

Mr. QUESADA. We hope so.

Mr. PYLE. I would certainly hope so. I think there is one other factor, Senator, that we must recognize. That pilot might get that airplane again. He wants to be darned sure it has been looked at.

Senator SMATHERS. I was coming to that. Does the next pilot who has the trip on that plane, he has it, of course, within his discretion, does he not, to look at that—not look at the plane, but does he get to see the report that is filed by the pilot who just brought the plane in?

Mr. PYLE. Yes.

Senator SMATHERS. Does he have it within his discretion to say that "I don't want to fly this plane until it has been checked"?

Mr. QUESADA. I think that every pilot in command has it in his discretion to refuse to fly an airplane. Further, I might say, if a pilot thought an airplane was in any way not airworthy, it would be quite imprudent for him to fly it and to not refuse. I, for one, would.

Mr. PYLE. One further point, Senator. No pilot to my knowledge—I believe—would ever take an airplane out without looking at the log to ascertain this very factor, what is inoperative and so forth.

Senator SMATHERS. The way the pay scale is operated, and the thing that always disturbs me a little bit as a constant rider of airplanes, is when a pilot finally says, "I don't want to take a chance with this plane tonight," he has to give up a certain amount of pay, does he not, if he doesn't fly that particular flight?

Mr. QUESADA. Sir, we try not to get into any labor problems. This is none of our concern.

Senator SMATHERS. That is right, and I understand it, and it is not any concern of ours. But here you have a situation where some pilots probably like all of us are not making as much as they would like, or maybe they have some sickness, and they think if I don't fly tonight I am going to lose $150 because it is a night flight, because I get a little more pay for that and I get paid for taking it through. It has been through severe turbulence but I think it is all right. I am a smart fellow, so away we go.

A minute ago you talked about the human factor of moving inspectors around. We have another human factor here. We never can eliminate the human factor, I thoroughly understand. But I am

concerned about a better way to determine if these planes, in fact, always are safe before they are taken off on a flight.

Mr. QUESADA. Sir, as Mr. Pyle indicated, if a pilot in command has described his airplane as having been through severe turbulence, this airplane is not allowed, by our rules, to be flown again until it has been inspected.

Taking another case in which a particular pilot might assert that this airplane, in his opinion, to which he is entitled—and I do not deny him this opinion, because we must rely on him—if he has a feeling that this airplane is not airworthy, and he is then put into a position of balancing the work to him, it would certainly be imprudent of him to say "I will fly to get my pay." I think they are better than that. I don't think they would do it. I think it would be quite unusual for a pilot to fly an unworthy airplane in order that he may——

Senator SMATHERS. I am sure pilots like to live just the same as the rest of us.

Mr. QUESADA. We certainly do.

Senator SMATHERS. They wouldn't do it if they actually knew. But, of course, there is that gray area where sometimes it is helpful to have certain standards set and steadfastly followed.

Mr. QUESADA. There are standards set and we try to follow them steadfastly. It is not received well in all quarters. I might address myself for the moment to this, because you are very interested in it. A recorder is a very good instrument to bring to light the points that you raise. We are attempting, on a high priority basis, to develop recorders that go beyond the requirements of the Civil Aeronautics Board. They are concerned in the determination of probable cause. We are attempting to develop recorders, and have them as a requirement to commercial air transportation, devices that will record other things. As an example, the state of the art today, right today, permits recorders to have up to 21 channels. These recorders can read out many things other than those that are now required. As an example, it could read out the g. forces that were encountered in landing. This might be an important factor.

We are also trying to find ways and means of having these recorders read out immediately after flight, which would bring great comfort to all. It would describe the things that occurred during that flight that the pilot might well be unaware of.

Senator SMATHERS. Let me ask you, right on that point: In these tests which you required these pilots to periodically make, is one of those tests one which involves making a heavy landing, a tough landing? By that I mean does the plane hit the ground particularly harder than it would under ordinary circumstances?

Mr. QUESADA. We don't require any—we don't impose on any pilot any requirement that would bring structural damage to the equipment.

Senator SMATHERS. You have them take it off, do you not, without all the engines in operation, just as an experiment?

Mr. PUTNAM. In the type certification test you mean? In the certification of the plane?

Senator SMATHERS. Just answer my question. I am not quite sure what I mean.

Mr. PUTNAM. Are you talking about flight tests for the pilots?

Senator SMATHERS. I am talking about not testing the aircraft, but when you test your pilots don't you sometimes get them off the runway and cut an engine on them and that sort of thing?

Mr. PUTNAM. We used to do it on the piston-engined aircraft. That was discontinued in 1957. On the turbine four-engine aircraft, after they reach the V–1 speed, we sometimes throttle an engine.

Senator SMATHERS. When you bring them around throttled, do you let them land that plane without full power?

Mr. PUTNAM. Yes, sir.

Senator SMATHERS. Is it not possible, in fact, is it not usual, that that plane would land a little harder than it ordinarily would with full power?

Mr. PUTNAM. It should not; no, sir.

Mr. QUESADA. If he is proficient it should not.

Senator SMATHERS. If it does, if he is not very proficient, then he lands, and does somebody make a report as to possible structural damage that could result?

Mr. QUESADA. All hard landings must be reported.

Senator SMATHERS. Even on tests?

Mr. QUESADA. Even on tests.

Senator SMATHERS. Why would it not be sensible to have just one or two planes in each company that are designated to make these tests of these pilots with this kind of an air recorder in them, if it is too expensive to put it in all planes now? Is that a good suggestion?

Mr. QUESADA. Sir, we have gone way beyond this. The Air Force and ourselves have recommended to the aircraft industry the centralization of their training and qualifying programs at one highly developed air base that would be able to establish thereat a highly developed curriculum for flight training; have inspectors that are detached from the companies, from the man they are inspecting, to where they could concentrate and afford better facilities, afford better simulators. We urge this, we urge it, but we have no means of requiring it.

Senator SMATHERS. With respect to the maintenance, where there has been a violation of your maintenance standards, what can you do other than levy a thousand dollar fine? Is that the maximum?

Mr. QUESADA. No, sir. We can take action against their certificate.

Senator SMATHERS. Has that ever been done? The FAA has never done it?

Mr. QUESADA. We have never done it, but we have come darned close to doing it.

Senator SMATHERS. Do you think that——

Mr. QUESADA. And the impact is a very severe one. Taking the certificate action against a company, we understand and recognize, and I am sure you will, too, that if this were unreasonable done, it could have a very severe impact on the public.

Senator SMATHERS. That is right. Do you think that the authority which you now have to maintain proper maintenance standards is sufficient or not?

Mr. QUESADA. We have ample authority, Senator. We have a lot of authority. I hope that we will use it prudently.

Senator SMATHERS. The chairman has given me a little leeway here and I am sorry to be taking time.

Senator MONRONEY. These questions are very helpful and useful in developing the general aviation picture.

Senator SMATHERS. Thank you.

In connection with talking about pilots, and tests, I have and I am sure you have heard that I have in my file, probably 50 telegrams from pilots saying that—to shift for a minute to a related matter—that you people continue to harass them. I wonder if you would mind stating for my benefit what it is that you do that these pilots consider harassment and taking from them authority to properly operate a plane.

Mr. QUESADA. I understand that you have received a large number of telegrams from one of these pilot groups which asserted that we are harassing. Before leaving this point that we raised a minute ago about the National Airlines pilots and buffeting, I would like to make sure the reporter has the telegram that they sent me and my statement that followed it, both in the record.

(The telegram and statement follows:)

[Telegram]

CORAL GABLES, FLA.

ELWOOD P. QUESADA,
Administrator, Federal Aviation Agency, Washington, D.C.:

In view of the recent NAL accidents and an ultimatum received today by the carrier from the FAA that recently instituted stalls, approaches to stalls, and unusual maneuvers must be continued on all proficiency checks even though notification was given the FAA some weeks ago that these maneuvers are not necessary are deleterious to the airframe and may eventually lead to failure, be advised that effective immediately, the pilots of NAL will not take proficiency checks until this matter is resolved. Copy to Hon. George Smathers, Senator from Florida, Mr. C. N. Sayen, president, ALPA, Mr. T. L. Boyd, NAL, Mr. W. Beroset, FAA, Miami.

R. J. ROHAN,
Vice Chairman or the Master Executive Council NAL–ALPA.

STATEMENT BY E. R. QUESADA, ADMINISTRATOR, FEDERAL AVIATION AGENCY

I want to make it clear that the statement made last night by a local official of the Air Line Pilots Association in Miami, suggesting that the recent accident at Bolivia, N.C., may have been caused by the effects of training maneuvers upon the aircraft structure is not supported by any evidence now known to the Federal Aviation Agency.

The maneuvers required in pilot proficiency checks place less stress and strain on the aircraft than that frequently encountered in routine and regularly scheduled operations.

A statement issued by Mr. L. W. Dymond, vice president of operations for National Airlines, in my opinion, clearly states the facts in this case. I do not believe any furthher comment on this matter is necessary.

The pilot proficiency problem appears to have originated as a result of a local misunderstanding.

Mr. Dymond said, "The maneuvers required of our pilots (National Airlines) on proficiency checks are those set forth in the civil air regulations and the misunderstanding which obviously exists is one that can be resolved immediately at the local level. Proficiency tests of National pilots are identical to those given on all types of planes on all airlines and are designed to assure proper maintenance of pilot technique. Our pilots will continue to take these tests."

Mr. QUESADA. The harassment that has been made publicly and addressed to us, and to which I referred in my statement as being irre-

sponsible, is of this kind. I was accused, or the Agency was accused, of harassing and engaging in a Gestapo activity.

In respect to the harassing or harassment to which you refer, which has been the recent accusation, it is because we saw fit, with the knowledge of the Civil Aeronautics Board, to conduct an accelerated inspection program after the year had its worst accident record in several years, double what it was last year, and for 30 days during the month of December we engaged in accelerated inspection programs, which they found harassing.

I might tell the committee the things that they found so harassing, and this inspection program which they found so harassing, was of this order of magnitude: Two-tenths of 1 percent of the 4 million hours flown by the scheduled airlines is the harassment to which they refer. Our inspectors flew approximately—within reasonable limits—two-tenths of 1 percent of all the time that the airlines flew. During this 30-day period, it was 1.6 percent, and that is what they found harassing.

I say for them to announce this to the public as they have as bringing hazard to the public is irresponsible. I would like to submit my statement on this point where I have publicly said so and put it in the record, if I may.

Senator MONRONEY. Is there any case which you have investigated, or any accident you know of, where the accident had, as a contributory cause, the harassment of the pilot by an inspector?

Mr. QUESADA. I know of none. You might ask the Board the same question.

Senator SMATHERS. What is it that you do? I am not so much interested in the volume of what it is, but what is it that you do? A fellow can drink a volume of water and it will not bother him. He can drink a small volume of alcohol and it will kill him. What is it that you do in this little time that you do it?

Mr. QUESADA. We do the same thing—in the 30-day period as we did the same thing we did all year, and we were performing the same process that had been performed ever since there has been an air transportation industry, by check, to determine if company procedures are being followed, if civil air regulations are being followed, if the degree of competency of the pilot is up to our standards. This has been going on for some 20 years.

Senator SMATHERS. Let me give you this illustration. Does this occur: The pilot is getting ready to fly through some reasonably turbulent air and there is a lot of traffic at that particular point, say near Philadelphia. In any event, does your inspector walk in at that particular point and say, "Captain, I want to see what you are doing." And does he bother him on those particular occasions? In other words, your particular inspectors, what kind of judgment are they using with respect to conducting these tests which have been conducted since the time the aviation industry started?

Mr. QUESADA. Sir, I would hope that their judgment is reasonable, and I have reason to believe that it is. I have asked the president of one of these groups, orally and in writing, to cite a single case where it was not. And I have not heard one.

If you would like to understand the procedures, Mr. Putnam can give them to you. I would like to accent that I have asked orally

and in writing to give me a single case, and they haven't produced one.

Senator SMATHERS. May I say this, and not to argue that particular point, that I know some of these people who have wired me, some of these captains. My information of them is of the highest. They are fine people; they are good pilots; they are good citizens. I don't believe that they would indulge to a great extent in a lot of completely irresponsible charges. So I can't help but think that possibly it is the manner in which this is being done that might give rise to some of the criticism. However, I would like to hear what it is that they do.

Mr. QUESADA. Senator Smathers, did any of the telegrams indicate a specific case of harassment? If they did, we would like to have them and we will look into it. If any one of them cited a particular case, we would be very grateful to have it and we will investigate them thoroughly.

Senator SMATHERS. I read them rather cursorily and I don't believe I saw any specific allegations. However, when I write each one I will ask them if they have any specific allegation.

Mr. QUESADA. We will be happy to have a specific case.

Mr. PUTNAM. We have very specific instructions on the conduct of these enroute inspections. It starts out by saying—

It is of the utmost importance that the inspector be thoroughly familiar with the air carrier's operations specifications, manuals, aircraft operating limitations, route, and navigational facilities.

That does not mean that he must be route qualified in the sense of flying the route regularly. He must be familiar with these instructions and these rules. They are, by training and background, fully capable of doing this.

The next step is:

The inspector will make arrangements to conduct an en route flight inspection by arrival in the dispatch office sufficiently in advance so as to assure the least possible inconvenience to the carrier. He will arrive at the airport in time to allow for all required observations prior to departure. A jump seat will be used whenever possible.

There are additional instructions on the conduct of this inspection. The things they are required to note, they are to observe—they do *not tell the pilot how to do it—they simply observe these procedures:* Instrument approaches made—they make pertinent comments or recommendations regarding the approach procedure, they observe dispatch and clearance, preparation of the flight plan, selection of altitudes and related matters. They check compliance with the fuel requirements and the loading of the aircraft, the adequacy of the weather reports and forecasts attached to the clearance, preparation of the load manifest, to note the observance of gross weights and CG limits.

Flight crew performance—use of the checklist, observe whether proper use is made of the checklist during all phases of the flight.

Pilot technique—smoothness, accuracy, and judgment are important items to be considered.

Cockpit discipline and procedures—acknowledgment of and compliance with ATC clearances.

Radio technique—compliance with CAR's, company operations manuals, and airplane flight manual.

Throughout the inspection the inspector will note by crew actions and decisions their knowledge of the above, adherence to authorized ATC clearances, ground crew performance, refueling procedures, functioning of equipment, instruments, engines, and airborne radio, condition of the facilities utilized, public protection, lighting, lamps and runway, firefighting equipment on ramps, radio, and all related things.

Those are the duties that are performed during these en route inspections. In view of the fact that we are all only human, personality clashes do develop on occasion, and I am sure that we can have such differences from time to time. We try to avoid them in every possible case.

As Mr. Quesada pointed out, we have not been informed of any of these cases. We would be more than glad to investigate any one of them and take whatever action is required.

Senator SMATHERS. All right, sir.

Why do you think, then, General, that we are getting all of these telegrams?

Mr. QUESADA. I will leave that up to you, Senator. I have referred to it in my statement. Are they from one group?

Senator SMATHERS. Yes.

Mr. QUESADA. Are they all from one airline?

Senator SMATHERS. The ones that I have, no. I don't have them all from one airline. I have them from two airlines. I don't have any, for example, from Pan American Airways.

Mr. QUESADA. I must tell you, Senator, we are engaging in a vigorous enforcement program. As I have indicated in my statement, there is a small group that is resenting it. I consider it my public duty to go ahead with our enforcement program in spite of this small group who are resenting it and creating distrust on the part of the public, creating distrust on the part of certain localities, creating distrust of certain companies. I just think it is wrong. Most of the people, most of the airplane pilots agree with me. So I am of that opinion.

Senator SMATHERS. Is this protest coming then, do you say, from just one or two airlines?

Mr. QUESADA. It is coming—in my opinion it is a small, hard-core group that is resenting and opposing our enforcement program.

Senator SMATHERS. Are they specifically located in one geographic area?

Mr. QUESADA. Well, no.

Senator SMATHERS. In other words——

Mr. QUESADA. But I judge your 50 are.

Senator SMATHERS. Sir?

Mr. QUESADA. I judge that your 50 are.

Senator SMATHERS. Naturally I don't hear from the pilots in Oklahoma. They wire to Senator Monroney. I only hear from the ones that I represent. I just wonder. I presume that there are pilots, are there not, all over the United States—do you have protests from all over the United States?

Mr. QUESADA. The president of the Airline Pilots Association has written to me a letter, and I will now put it into the record. This letter was in response to one that we wrote to each president of every

air carrier. We requested him and required him to stop the practice of permitting the crews to spend unnecessary time in the cabin. The response to this was extremely favorable. All of them responded most cooperatively. I might put that in the record.

I got a letter dated May 15, 1959, which accused us:

These representatives have now embarked on a program of petty and childish harassment in the administration of your letter.

Referring to this letter.

Your letter has had the effect of a new regulation.

The regulation had been in effect I don't know how many years.

It went on to say:

I hope that you never attempt such a frivolous and useless project and leave such matters to the pilot's judgment.

Senator SMATHERS. What specifically did they refer to there, do you know?

Mr. QUESADA. To our requirement that they must stay in the cockpit and perform the duties of the crew, and not perform other duties. The letter is here.

However, this childish Gestapo program now in operation * * *

This letter was made public even before it was sent to me. I therefore put the letter in the record and I would like to put my answer into the record, too.

(The material follows:)

MARCH 3, 1959.

I feel compelled to call your attention to the serious so-called near-miss problem. I know that you are well aware of this problem and the responsibilities we all share in it, and feel certain that, by constant emphasis on the importance of vigilance, you can materially assist us in this prevention.

The current rash of near-miss incidents forceably points out that all pilots must be more vigilant to the presence of other aircraft in the airspace. This is particularly true when operating IFR under VFR conditions. An IFR flightplan, as has so often been indicated, in no way reduces the necessity for continual visual surveillance.

We must all candidly recognize the existing limitations of our control system and cockpit visibility, as well as the vast mixture and speeds of modern aircraft. We must also recognize that there is no substitute for maintaining a thorough and vigilant watch for other air traffic at all times.

It has been my personal experience, when riding with commercial air carriers, that too often the pilot is back in the cabin talking to passengers or engaging in other endeavors not essential to his duties. This practice must cease forth with.

I draw your attention to part 40.354 of the Civil Air Regulations which states:

"Flight crew members at controls. All required flight crew members shall remain at their respective stations when the airplane is taking off or landing, and while en route except when the absence of one such flight crew member is necessary in connection with his regular duties. All flight crew members shall keep their seat belts fastened when at their respective stations."

While I fully realize that pilot vigilance alone is not the entire answer to the near-miss problem, I am confident that it will serve to lessen the hazard until the positive and constructive program we now have underway to expand and improve our air traffic management facilities becomes effective.

I want to make it perfectly clear that this letter is not intended as a criticism of the pilot group as a whole, but rather that it is an effort to emphasize an extremely important responsibility that must be borne by all crew members.

I also want to point out that a similar letter has gone to the military services and other civil aviation organizations to insure that this message reaches all users of the airspace.

I am sure we can reduce the exposure and alleviate to a considerable extent the near-miss hazard. I shall very much appreciate your continued cooperation in connection with this vital matter.

Sincerely yours,

E. R. QUESADA, *Administrator.*

AIR LINE PILOTS ASSOCIATION,
Chicago, Ill., May 15, 1959.

Mr. E. R. QUESADA,
Administrator, Federal Aviation Agency,
Washington, D.C.

DEAR MR. QUESADA: A ridiculous situation involving representatives of the Federal Aviation Agency has been brought to my attention and I am writing you concerning it in anticipation that early remedial action will be taken.

As the problem is reported to me, inspectors of the Federal Aviation Agency (and I understand that in many cases these individuals' normal assignment is maintenance inspection), while riding on airline airplanes, are timing the visits of the pilot in command to the passenger cabin and filing violation reports against him. These reports seem to have no particular logic and we have been informed that some of them are for absences from the flight deck for periods of from 7 to 23 minutes.

We are aware of your letter addressed to all airline presidents on March 3, 1959, calling attention to the necessity for pilots' remaining at the controls of the aircraft and avoiding long visits to the passenger cabin except for essential business. For that matter, you sent a copy of the letter to us and we published it in order to bring it to the attention of all pilots.

However, evidently rather than the representatives of the FAA treating the pilot like a mature, rational individual to whose judgment is entrusted many lives and large investments in aircraft and other property, these representatives have now embarked on a program of petty and childish harassment in the administration of your letter. The net result, unless some commonsense is injected into this situation very soon, promises to be a complete deterioration of respect for the inspectors of the FAA and a complete breach in the relationship between these individuals and the pilots with whom they work.

Let us analyze for a moment the ridiculous situation in which we find ourselves. The pilot in command has a statutory responsibility for safety in the passenger cabin. For many years, he has been encouraged to make periodic visits to the passenger cabin to observe that sound safety practices were being observed, to promote good will, and to determine that the passengers were receiving proper service.

The physical needs of the pilot require that he visit the cabin since all rest room facilities are located in that area and, as you may know, the passenger capacity in relationship to the lavatory capacity on many aircraft today requires that the pilot may have to wait for long periods in order to use the facilities. And, of course, the sensible pilot gets out of his seat occasionally to exercise, restore his circulation, and, therefore, to retain his alertness. The only place on an aircraft where such a break can be taken is in the passenger cabin.

I would also like to bring to your attention that many airlines are now serving alcoholic beverages to their passesngers and, although we have objected strenuously, the responsibility to maintain law and order aboard the aircraft even under such conditions rests with the pilot in command.

Your letter has had the effect of a new regulation. However, it has been done by a general assertion and you have not defined your terms. You have not specified the maximum time that can be spent in the passenger compartment, how many trips can be made to the passenger compartment, what is a justifiable reason for visiting the passenger compartment, or the many other indistinct areas involved. I hope that you never attempt such a frivolous and useless project and leave such matters to the pilot's judgment. Yet the representatives of the FAA are attempting to apply some sort of exact measurement to this general rule and to substitute their judgment for that of the pilot in command in this undefined area. Such treatment of mature people is, in my view, plainly ridiculous.

With all the many safety problems that are unresolved in the industry, the many areas in which FAA could improve its performance, the many recom-

mendations that we have made to the Civil Aeronautics Board and more recently to the Federal Aviation Agency for improvement in air safety, it seems to me that the representatives of the Federal Aviation Agency have better things to do than those which I have just described.

We have long concurred in the necessity of having two qualified pilots on the flight deck at all times and we have made recommendations for many years to the Federal Aviation Agency on this subject. To this date, the only concrete action that has been taken by the FAA was your letter regarding the pilot in command visiting the passenger cabin and the recent actions by your inspectors.

We have pointed out to you that under your present regulations, only the pilot in command of the aircraft is required to be qualified in the particular aircraft being flown. We have repeatedly requested that the regulations be revised to require that the copilot also be qualified and provided with a type rating on the particular aircraft to which he is assigned and that he be given the opportunity for periodic training. We have pointed out to you that if something should happen to the pilot in command, insofar as the Federal regulations are concerned, the copilot is not required to be qualified on the particular aircraft and the third man in the airplane is not required to be able to fly at all. While we have been taking positive steps to provide protection for the traveling public in these areas, the Federal Aviation Agency has done little or nothing.

We would also like to point out once again that food poisoning, diarrhea, a bird through the windshield, and many other common occurrences can completely incapacitate the pilot in command and that under your present regulations, no protection for the passengers is afforded.

An occasional trip by the pilot in command to the passenger cabin to carry out his statutory responsibilities is the least of our worries. We have major air safety problems in this entire crew qualification and training area, in the air traffic control area, in the inadequacy of our airports, in providing the pilot in command with adequate tools with which to work including airborne radar, in insuring that the carriers' training programs are adequate, and in many other major safety areas.

You are still permitting, under the Federal regulations, a two-pilot crew to fly over 12 hours in international operations. In other words, these two pilots can be scheduled to fly jet aircraft for 12 continuous hours or 6,000 miles or more without relief.

If the actual flight time exceeds the schedule, insofar as the regulations are concerned, the two individuals can find themselves faced with flight assignments longer than 12 hours. Now you say they are also supposed to remain continuously strapped in their seats. Our kidneys and circulatory systems are not that good.

The mature airline pilot is completely aware of the necessity of having an adequate crew on the flight deck at all times. He is also aware of his responsibilities in the passenger cabin and of the necessity that he maintain himself in an alert and healthy condition. Your communique on the subject was brought to the attention of our members. However, the childish gestapo program now in operation trying to reduce this memorandum to a rigid rule is a complete waste of the taxpayers' money which could well be spent in other areas.

If this is an example of how the FAA intends to devote its time and energy, we have real problems on our hands. I trust that this is not true and that you will take prompt action to see that this problem is remedied.

With best regards, I am,

Sincerely yours,

CLARENCE N. SAYEN, *President.*

[For immediate release]

STATEMENT BY E. R. QUESADA, ADMINISTRATOR, FEDERAL AVIATION AGENCY

I deny categorically the recent public statement by Mr. Clarence Sayen, president of the Air Line Pilots Association, in which he was quoted as charging that the FAA has instituted "a program that is endangering lives through petty ridiculous harassment of flight crews by unqualified or incompetent FAA inspectors."

This is the second time in less than a year that Mr. Sayen has employed invective to disparage and intimidate the dedicated inspector personnel of the Federal Aviation Agency. Early last year, the FAA sought to assure compliance with the most elemental rule of flying, namely, that the pilot must stick to his job and fly the airplane. Mr. Sayen then described our efforts as "petty and childish harassment" and charged us with undertaking a "childish gestapo program." I advised Mr. Sayen then and I repeat now, "If you can cite an instance in which an inspector has been arbitrary or unrealistic, I shall be glad to investigate and take such corrective action as may be required." Mr. Sayen cited no instance then, and his recent statement was similarly lacking in any factual support.

Mr. Sayen is further quoted as saying FAA inspectors are harassing pilots to such an extent that "it is affecting their good judgment, thus endangering lives." The facts are that the American-flag carriers flew 4 million hours during 1959.

FAA inspectors rode with flight crews two-tenths of 1 percent of this total time. This practice is routine and has been standard procedure for two decades. Frankly, I have serious doubts that this inspection program is adequate to meet the needs of public safety. Mr. Sayen's charges are vitriolic, intemperate, and false, and in my opinion constitute a disservice to the public and to the airline pilots, a group whom I hold in high esteem.

Mr. QUESADA. This is my letter to the president of the Airline Association, which was followed by a release which I would like to put in the record, in which my letter was referred to as an "emotional diatribe attacking ALPA and its members."

I hope the committee will read my letter.

He is also attempting to mislead the public into thinking that all their problems will be solved by reliance on the "see and be seen" concept.

We have never said our troubles will be left to the reliance on the see and be seen concept. It is a concept we must employ. We have no alternative but to employ it. I put that into the record.

(The letter and press release follow:)

FEDERAL AVIATION AGENCY,
Washington, D.C., June 12, 1959.

DEAR MR. SAYEN: I have withheld reply to your publicly released letter of May 15 in order to avoid the human tendency to let one excess provoke another. Much as I deplore what appears to be a calculated abuse of this Agency and its inspector personnel, I am more concerned over the possible adverse effect upon public confidence. By suggesting, as you have, that your members be exempted from enforcement of regulations that require pilot vigilance, you infer that airline pilots value convenience more than the safety of passengers and fellow airmen.

Surely, this could not have been the intent of your objection of the Civil Air Regulation requiring flight crew members to attend their duty stations. Because your allegations can be misinterpreted in just this way, I believe it necessary that they be answered plainly, and that the issue be brought into sharp focus. If aviation is to prosper, it is essential that the public have confidence in the vigilance and alertness of all flight crews, both civil and military. It is essential the public understand that most pilots do not share your views. It is essential the public understand how deserving most pilots are of the trust reposed in them. And finally, it is essential the public understand that this Agency will not be threatened into retreat from the responsibility it bears for doing all within its power to prevent a repetition of the three midair collisions which shocked the Nation and brought grief to hundreds of American homes.

I do not dispute your right to challenge the rulings of this Agency any more than I challenge your right to dispute my administrative judgment. Had you presented evidence of unreasonableness on the part of our inspectors, I would have been happy to investigate each case. Instead, you accused them extravagantly and generally, of arbitrary and capricious conduct in the performance of their public duties. If you genuinely believe this to be true, I would remind you that the law clearly gives you access to the courts for relief.

The Congress, as you know, has commissioned the Federal Aviation Agency to defend the public interest, and to provide for the safety of the flying public. As long as we are charged with this responsibility, we shall continue to prescribe, as sensibly as we can, such regulations as will minimize the possibility of human and mechanical failure. And, as long as such regulations exist, we shall enforce them with the diligence they deserve.

As I understand it, you object to enforcement, by inspection, of the civil air regulation which now reads as follows:

"All required flight crew members when on flight deck duty shall remain at their respective stations while the airplane is taking off or landing, and while en route except when the absence of one such flight crew member is necessary for the performance of his duties in connection with the operation of the airplane. All flight crew members shall keep their seat belts fastened when at their respective stations."

You refer specifically to my letter of March 3, 1959. In it I called to the attention of presidents of the airlines the existence of this requirement. Similar letters were sent to the Secretaries of the Army, the Navy, and the Air Force, as well as to the several organizations representing the private and corporate flier. In one of these 80 letters, I appealed for increased pilot vigilance and and stricter observance of this requirement. You are the only one who has objected.

The response of the others to my appeal is indicative of general concern over the need for reducing our near-miss hazard. Until we can develop tools more effective than the human eye in the avoidance of air collisions, the "see and be seen" principle must be rigorously applied and diligently enforced.

There are, as you know, some 22,000 military and 70,000 private aircraft privileged to use the U.S. airspace. The pilots of these 92,000 aircraft have the right to demand that "they be seen," not only by each other, but by the pilots of the 1,900 commercial aircraft. The precautions that are necessary to avoid air collisions must be equally and uniformly binding upon all pilots.

Next, you have asserted that my letter of March 3 "has had the effect of a new regulation." The civil air regulation which I cited had been in force since April 1, 1954. Not so much as a comma had been changed. Aside from that regulation, part 61.7801 of civil air regulations treats the same requirement for flight crew vigilance with equal force. It has been law since December 31, 1936. Your assertion is clearly untrue.

Thereafter, you allege that Federal Aviation Agency inspectors are filing violation reports against flight crew members for absences from the flight deck "for any purpose whatsoever."

The inference here is that we have been unreasonable in our enforcement of the regulation. Your assertion forces me to cite two cases in which we have taken action against flight crew members for violation of this rule. In citing these cases, I wish to make it clear that I do not impugn the discretion and competence of our professional airline pilots and their crew members. These cases represent exceptions to high standards that most airline pilots have set for themselves. They are, however, the kind of exceptions that justify enforcement.

The first involved a near miss between a DC–7 with 35 passengers aboard and an Air Force tanker engaged in the refueling of two fighter aircraft. The Air Force aircraft were on the right, and consequently had the right of way according to Civil Air Regulation 60.14. They had landing lights, running lights and refueling lights showing. The DC–7 had its running lights showing. The pilot of the tanker saw the DC–7 at a distance of more than a mile. The pilot of the DC–7 gave no evidence of ever having seen the Air Force tanker. Investigation disclosed that the pilot of the DC–7 was in the passenger cabin for reasons we contend were neither incident, nor necessary, to the performance of his duties as provided for by the civil air regulation to which you object. A civil penalty has been imposed. The pilot of the DC–7 has the option of paying or forcing us to take the case to court. In court, the burden of proving the violation rests with the Department of Justice. The pilot's rights are fully protected.

The second case involved a 707 jet transport with 119 passengers aboard. In this instance, the aircraft was cruising normally and in darkness at 31,000 feet over the North Atlantic. The automatic pilot failed, and disengaged, and the aircraft proceeded unattended into a descent. As speed increased, the aircraft

dropped its right wing, rolled on its back and went into a vertical dive. Its speed approached that of sound. When the aircraft was finally pulled out of this uncontrolled position at 6,000 feet, it was subjected to g. forces which exceeded the design limits of the aircraft by a wide margin. The aircraft sustained major structural damage and narrowly escaped complete structural failure.

As you are aware, the auto-pilot had failed twice before on the previous eastward passage of this airplane. It had failed also on the Paris-London leg of this same westbound flight, with the same flight crew in attendance.

A failure of the automatic pilot causes a warning light to flash on in front of the pilot's seat. On this occasion, however, the warning went went unnoticed. The pilot's seat was empty. Investigation disclosed that the pilot had withdrawn to the passenger cabin for reasons not necessary to his normal duties. A civil penalty was levied against the captain and has been paid by him. Had he not demonstrated extraordinary courage and skill in getting back to the flight deck in time to retrieve his error, aviation could have experienced its greatest single air disaster.

The issue has been distorted further by your allegation that violation reports are being filed against pilots who leave the flight deck briefly to attend their own bodily needs. This is an absurd contention and I believe you know it. If you can cite an instance in which an inspector has been arbitrary or unrealistic, I shall be glad to investigate and take such corrective action as may be required.

Throughout the text of your letter you have gone out of your way to disparage the professional competence and integrity of the inspectors of the Federal Aviation Agency. You have termed their efforts "ridiculous." You have accused them of "petty and childish harassment." Not content with this, you have employed invective, in the absence of evidence, and attempted to make a rhetorical circus of the issue by charging them with having undertaken a "childish Gestapo program."

Although we do not pretend to perfection, I believe we have achieved a reasonable reputation of fairmindedness and commonsense. At any rate, most pilots appear tolerant of our efforts and cooperate willingly.

In their enforcement of Civil Air Regulations, our inspectors are instructed to be fair, factual, and firm. You have offered no evidence which would cause me to doubt their discretion or judgment. Unless they can be shown to have been arbitrary or capricious, unless they can be shown to have exceeded their instructions, I shall continue to respect their sincerity, their competence, and capacity for sound judgment.

There is often a tendency for those who are inconvenienced by regulation to vent their annoyance against the public employees responsible for enforcement. Unless officials charged with the conduct of Government functions resist these accusations, we shall not merit the loyalty of our employees, nor shall we attract the competence that is essential to public service. I shall vigorously defend this Agency's inspectors on any and all occasions when they are subjected to unwarranted attack in the performance of their lawful duties.

Finally, I am astonished by the note of intimidation which I read into your inference that vigorous enforcement of this safety regulation on flight deck vigilance will be met by a program of noncooperation among airline pilots in the air safety program. I would hope that this inference is an accident of language rather than a statement of intent.

I have referred repeatedly to the overriding interest of the public in this issue of air safety. As taxpayers, they have the right to insist that this Agency be diligent in its concern for their welfare. And as fare-paying passengers, they have the right to expect full-time services from the pilots with whom they fly.

In conclusion, I hope the foregoing will dispel any doubts you may have had as to the intent of this Agency to enforce sensibly but vigorously this most elemental of all flight safety principles. An airline pilot—as in all other forms of transportation—should be in a position to see where he is going.

The Federal Aviation Agency will always welcome your views, but must insist that your statements be accurate, and we would hope that your comments will be constructive. If you will meet us halfway with an attitude of helpfulness rather than harassment, I am sure we can work as amicably together in the future as we have in the past.

Since you chose to make your letter public, I have no alternative but to do likewise.

Sincerely yours,

E. R. QUESADA, *Administrator.*

[Press information]

PUBLIC RELATIONS DEPARTMENT,
AIR LINE PILOTS ASSOCIATION,
Chicago, Ill.

CHICAGO, ILL., June 17, 1959.—The Air Line Pilots Association (AFL–CIO) today replied to a letter from General Quesada, Administrator of the Federal Aviation Agency, with the assertion that Mr. Quesada had "completely missed the point" of a recent association letter to him.

The association said it had written Mr. Quesada raising questions concerning a number of safety problems which are Mr. Quesada's responsibility and, in turn, received Mr. Quesada's public released letter, which they called an "emotional diatribe attacking ALPA and its members."

The following statement was issued by C. N. Sayen, president of the Air Line Pilots Association:

"It is a sad letter.

"Evidently Administrator Quesada completely missed the point of our correspondence and rather than reply to the safety problems raised, has chosen to play to the grandstand by a public release.

"The association raised a number of serious safety problems with the Administrator. They are serious problems which come under his responsibility. In reply, we have received an emotional diatribe attacking the Air Line Pilots Association and its members. This is hardly appropriate to the high office and responsibilities accepted by the Administrator. We have a right to expect better performance.

"What is even more important, the Administrator has completely missed the point of the safety problems raised by the airline pilots. He has attempted to convey to the public that the airline pilot is conducting himself irresponsibly by filing a complaint with the Administrator. If Mr. Quesada is to be so thin-skinned, he has rough days ahead. Additionally, we will compare the safety records in civil aviation of this organization and its members with any institution in our society. He is also attempting to mislead the public into thinking that all of their problems will be solved by reliance on the "see and be seen" concept which every responsible individual in aviation concerned with safety has condemned as obsolete 4 and 5 years ago."

We will reply to Mr. Quesada's diatribe in due time.

ED MODES,
Director, Public Relations.

Senator SMATHERS. These are the same rules and regulations which have been in effect for how many years?

Mr. QUESADA. I think this has been in effect for 10 years. I would like to say that my letter to the airline presidents was brought about because of the condition I described in my statement, when an airplane of this character, carrying 131 passengers, turned over on its back just like that [indicating], just like that—with 119 passengers—and the pilot was, in fact, in the cabin.

I assure you, Senator, I will not permit this to occur. I think it is a real outrage to the public.

Senator SMATHERS. Is that the only additional regulation that has been put into effect since we have had the FAA?

Mr. QUESADA. In the first place, I said it has been a regulation that has been in existence around 10 years. It is not new.

Senator SMATHERS. What are the new regulations that you have put into effect?

Mr. QUESADA. I will go to my statement.

Senator SMATHERS. Let's say in the last 6 months, with respect to these pilot checks.

Mr. QUESADA. That was in my statement, Senator, but I will try to find it quickly for you.

In respect to pilot checks?

Senator SMATHERS. No, with respect to this procedure which the pilots say is harassment, as you say.

Mr. QUESADA. There are no new regulations. We never put in any regulations that are harassing.

Senator SMATHERS. I know, but have there been any new regulations? Have you put in any new ones—I know that you would not put them in with the intention of just harassing them. But the question I am trying to get to is have there been any new regulations within the last 6 months which, in its normal application of the new regulations, would lead to the pilot concluding that they are being harassed?

Mr. QUESADA. I know of none.

Senator SMATHERS. You know of none?

Mr. QUESADA. I know of none and none have been borught to my attention. We have asked them, orally and in written form, to give us any example that they thought should be brought to our attention, and not one has. And my letter says so.

Senator MORTON. But you have put in new regulations?

Mr. QUESADA. We have put in many new regulations.

Senator SMATHERS. Could you give us some idea of how you expect to resolve this problem where this group of pilots say they are not going to take these certain tests where they stall the plane or go into a close stall?

Mr. QUESADA. That is very easy to answer, Senator. If they don't do it they won't be certificated.

Senator SMATHERS. General, in this matter of providing for additional safety for the traveling public, why is it that you have not required the copilot to have the same training and the same certification that the principal pilot has?

Mr. QUESADA. We have instigated a rule, implemented a rule, that requires the second in commond to undergo a test that is quite similar to that of a pilot in command. We are required, by rules, that all the air carriers will develop a training program that requires this.

In order that it might be clear I might read a statement, knowing that this was coming up:

> On December 1, 1959, the Federal Aviation Agency issued a civil air regulation to straighten the proficiency requirements of air carrier pilots other than pilot in command. The rule established new, greatly strengthened standards of competence for both the second in command and other pilots. The new regulation for the second in command require that he receive specific flight instructions and practice in certain maneuvers considered essential in order to be certain that he is competent to pilot and navigate the aircraft, including instrument conditions. He must demonstrate this proficiency either to a check pilot or to a representative of the Administrator; and must do so in each type of airplane in which he is to serve. In order to assure that he continues competent, he must demonstrate each 12 months satisfactory accomplishment of a proficiency checfl. The training program for the second in command, as well as other members of the flight crew, must meet with approval of the Administrator.

Senator SMATHERS. The date of this letter is what?

Mr. QUESADA. This is not a letter.

Senator SMATHERS. The date of the regulation is what?

Mr. QUESADA. December 1, 1959.

As the committee well knows, it is impossible to legislate proficiency overnight. The proposed rule requires the establishment of compre-

hensive training programs by the aircarrier, and the adequacies of these programs must be reviewed and approved by the agency.

The air carriers are required to submit the curriculum of their training program for such approval not later than May of this year. It will then be necessary for us to review and approve these training programs. Thereafter, the programs must be put into effect and the actual training accomplished before the pilots in question can be expected to meet the new proficiency requirements. All pilots utilized as second in command by aircarriers, commencing January 1 of next year, must have had the prescribed training and satisfactorily passed the new proficiency check. Thereafter they must be kept current by passing proficiency checks every 12 months. The basic difference between the requirement of captain and the second in command is that the captain has an ATR, and the second in command does not.

Senator SMATHERS. What is an "ATR"?

Mr. QUESADA. Air transport rating.

Senator SMATHERS. The second in command does not have an air transport rating?

Mr. QUESADA. He is not required to have an air transport rating. But he is required to meet a specific training program that we have prescribed, and a proficiency check.

Senator SMATHERS. You don't believe that he should be required to have an air transport rating?

Mr. QUESADA. We don't thing it is necessary; no, sir.

Senator SMATHERS. But you do think it is necessary, of course, for the pilot?

Mr. QUESADA. Yes, sir.

Senator SMATHERS. If something happens to the pilot, then this fellow for whom it is not necessary to have quite as much training, you still feel those people are pretty safe back there?

Mr. QUESADA. Our training program will be designed to meet that requirement. We won't approve it unless it does.

Senator SMATHERS. What is the difference between an air transport rating and a copilot? What does the copilot have to additionally do to get an air transport rating?

Mr. QUESADA. Mr. Putman might describe it.

Mr. PUTNAM. The copilot must have a commercial pilot's certificate and an instrument rating. Those are the minimum certificate requirements.

Do you want to know the difference in the standards?

Senator SMATHERS. Briefly tell us additionally what the pilot has by virtue of his air transport rating that copilots don't have?

Mr. PUTNAM. The airline transport pilot in command must demonstrate a very high degree of skill and proficiency on all maneuvers involving the aircraft. The copilot, under this new rule, will not be required to have the same high degree of proficiency, and many of the maneuvers will be done by visual reference rather than under the hood, simulating instrument conditions as in the case of the captain now, with the ATR.

Senator SMATHERS. Do you think that the passengers who are riding are as safe in having a man operate the plane half the time who has not been required to demonstrate his capability of landing the plane as well as has the command pilot?

Mr. QUESADA. Our whole program that we have recently initiated is designed to meet the very situation that you described. It is designed to assure that the second in command is qualified to meet these conditions should they arise.

Senator SMATHERS. This regulation which you put out in December, and which I think I wrote you about last summer—and I congratulate you on putting it out—your answer, for another way of saying it, is that you are upgrading, so to speak, the capabilities of the copilot?

Mr. QUESADA. Oh, by a tremendous amount, Senator Smathers. If I could draw this thing in its boldest relief—this isn't true, but the rules permitted this to be true—that a person could have been a copilot on a 707, having gotten his commercial license in a Taylor Cub. And this is not right. This is wrong.

I want to quickly say that the copilot or second in command in 707's are, as a general rule, if not in all cases, very highly qualified pilots. They are very, very fine pilots, and in many cases actually have ATR's in their own right already. I am speaking of the old rule. This rule will require the copilot, or the second in command, because we think it is important that there be one man in command of the ship, and this is a practice that is employed in practically every field of transportation, and that is one of the reasons why we said "second in command" so we wouldn't create any confusion in that respect.

Our whole program is designed, and it will—I will guarantee to you that it will—will raise the necessary proficiency qualifications of the second in command to a very, very high standard to meet the very points that you have raised.

May I put the rule in?

Senator MONRONEY. Yes.

(Rule follows:)

UNITED STATES OF AMERICA, FEDERAL AVIATION AGENCY, WASHINGTON, D.C.

Civil Air Regulations Amendment 40–21

Effective: January 1, 1961.[1] Issued: December 1, 1959

PART 40—SCHEDULED INTERSTATE AIR CARRIER CERTIFICATION AND OPERATIONS RULES

Approval of Air Carrier Training Programs; Qualifications of Pilots Other Than Pilots in Conmmand; Proficiency Checks for Pilots Other Than Pilots in Command

The Federal Aviation Agency published as a notice of rule making (24 F.R. 5246) and circulated as Civil Air Regulations Draft Release No. 59–3, dated June 25, 1959, a proposal to amend Part 40 of the Civil Air Regulations to require: (1) FAA approval of air carrier training programs; (2) appropriate aircraft ratings for pilots serving as other than pilots in command; and (3) more specific initial training and recurrent proficiency checks for pilots serving as other than pilots in command.

Interested persons have been afforded an opportunity to participate in the making of this amendment and due consideration has been given to all relevant matter presented. Because of the importance of this amendment, each portion thereof has been evaluated in the light of such comments.

1. *FAA approval of air carrier training programs.* The air carriers commenting on this portion of the proposal expressed strong opposition to it. Briefly, the air carriers contend that the present regulatory scheme for the

[1] Except as otherwise provided in § 40.290.

establishment of methods and procedures for crew member training programs has been adequate and that no justification has been shown for requiring FAA approval of such programs. The FAA is unable to agree with these contentions.

It must be emphasized that the training program is one of the most important factors in the safety of air carrier operations. The quality and scope of such programs are the key to insuring that all crew members are competent to perform their duties with the high degree of skill expected and required in air carrier operations. Under the provisions of the present regulation, the air carriers are given discretion in establishing "adequate" or "appropriate" training, or "training as necessary." As a result some air carriers have prepared and are administering excellent training programs. However, others have not achieved the minimum safety objective sought by the training requirements of §§ 40.280 through 40.289. While the methods and procedures employed by the various air carriers in their training programs may differ to fit the particular operation of each air carrier, each training program must provide a uniform and minimum standard of flight and ground training necessary for safety in air transportation. Experience in the administration of the present regulations shows that this standard can only be achieved by FAA approval of each training program.

Accordingly, because of the vital importance which the air carrier training program has to safety in air carrier operations, each air carrier subject to this part will be required to obtain approval of its training program by a representative of the Administrator.

This final regulation will not alter the responsibility which each air carrier has at present for the preparation and administration of its training program. However, each air carrier will be required to submit its training program, and subsequent changes thereto, to the FAA for prior approval.

2. *Initial training qualifications of pilots other than pilots in command.* The complexity of modern aircraft and the operational demands of today's navigation, communication, and air traffic control systems require a high level of skill and competance for air carrier copilots. Many of the functions which are required of the copilot, particularly with respect to emergency procedures, must be performed properly or the safety of the flight may be seriously affected. In addition, in the event that the pilot in command becomes incapacitated during flight, the copilot must possess adequate knowledge and skill to fly the aircraft safely to a destination.

In order to properly determine the ability of the copilot to operate a particular type of aircraft, it was proposed in Draft Release 59–3 to provide for the issuance of appropriate aircraft type ratings for all pilots serving as other than pilots in command. However, upon reevaluation of the original proposal in the light of comments received, it appears that the objective of the original proposal can be achieved without requiring pilots serving other than as pilots in command to obtain an appropriate aircraft type rating, provided adequate flight training for those pilots who serve as second in command is provided in the initial and recurrent training requirements for those pilots who serve as second in command is provided in the initial and recurrent training requirements of this part and is part of the training program approved by the Administrator.

Accordingly, the original proposal has been modified in this regulation by omitting the aircraft type rating requirement. In lieu of a type rating, this regulation prescribed in § 40.282 (c) certain minimum maneuvers and procedures in which it is considered necessary that pilots serving as second in command be proficient, and requires that they receive instruction and practice in such maneuvers and procedures during initial flight training.

The term "second in command" is used in this regulation in order to identify more precisely those pilots who perform the traditional functions of a copilot, as distinguished from the pilot in command and other pilots. In this respect this regulation amends current § 40.261(c) to make it clear that where the air carrier is authorized to operate under instrument conditions or operates aircraft of more than 12,500 pounds maximum certificated weight, the minimum pilot crew shall consist of a pilot in command and a pilot designated as second in command. An appropriate definition of "second in command" is added by this regulation. In keeping with these changes, an appropriate amendment is also being made to § 40.301.

It is considered that pilots qualifying to serve on airplanes other than as pilot in command or as second in command should, in the interest of safety, be required to receive the flight training specified in § 40.282(a) and demonstrate their ability to take off and land each type of airplane in which they are to serve, in addition to accomplishing the other training requirements provided in §§ 40.280 and 40.281. Accordingly, such a requirement is prescribed in this regulation.

3. *Proficiency checks for pilots other than pilots in command.* In order to make certain that all pilots serving as second in command are initially proficient and continue to maintain their proficiency to pilot and navigate, and to perform their duties on, aircraft to which they are assigned for duty, it was proposed in Draft Release 59–3 to require proficiency checks to be given such pilots prior to their initial assignment to duty and twice each 12 months thereafter by a check pilot or a representative of the Administrator.

As indicated in the draft release, the present method of having the second in command checked by the pilot in command during daily operations is not an adequate method by which the continued proficiency of the second in command can be determined. Although the air carriers were opposed to this requirement, the Agency remains firm in its belief that in order to make certain that all pilots serving as second in command are initially proficient and continue to maintain such proficiency, they must be given a proficiency check by a designated check pilot or a representative of the Administrator. However, upon reconsideration of the original proposal in the light of comments received, the Administrator has concluded that an adequate level of safety will be maintained if such proficiency checks are given only once each 12 months to pilots serving as second in command. Accordingly, such requirements are reflected in this amendment.

In Draft Release 59–3, it was proposed to include in the proficiency check at least the takeoffs and landings and other flight maneuvers generally covered in § 40.282(a). However, the original proposal is being modified by this amendment to provide that the proficiency check for a pilot serving as second in command shall include an oral or written equipment examination, and at least the procedures and flight maneuvers specified in the new § 40.282(c).

Comment received indicated that interested persons opposing Draft Release 59–3 believed the proposal would require copilots to acquire and demonstrate the same level of proficiency as is presently required of pilots in command. The Administrator wishes to make it clear that identical proficiency standards will not be required for such pilots. Under the provisions of Part 40, a pilot assigned to perform copilot duties as second in command is required to hold a commercial pilot certificate and instrument rating, whereas a pilot in command is required to hold the higher rating of an airline transport pilot certificate with appropriate aircraft type ratings. In view of the difference in the certification requirements, pilots serving as second in command will not be held to the high degree of skill required of a pilot in command. However, they will be required to demonstrate that they possess the knowledge and skill to perform their duties as a copilot safely and efficiently, and to navigate and pilot the airplane to which they are assigned safely to a destination in the event the pilot in command becomes incapacitated during flight.

This final regulation is so drafted as to permit the air carriers to use the flight crew method of training and checking pilots. Air carriers utilizing this method have found that it has economic advantages over the method of training and checking crew members individually and is an effective method of standardizing training. Although initial flight training and some proficiency check maneuvers will make it necessary in the interest of safety for the check pilot to occupy one of the pilot positions, it appears that many maneuvers can be conducted safely using the flight concept of training and checking pilots.

This regulation is being made effective January 1, 1961. This effective date will allow air carriers subject to Part 40 sufficient time in which to obtain FAA approval of their training programs and to accomplish the initial demonstration check of pilots other than pilot in command required by this amendment. However, each air carrier will be required to submit its training program to the FAA for approval not later than May 1, 1960.

Although compliance with the requirements prescribed in this regulation may result in some additional costs to the air carriers, it appears that such costs are outweighed by the considerations of safety involved.

In consideration of the foregoing, the Federal Aviation Agency hereby amends Part 40 of the Civil Air Regulations (14 CFR Part 40, as amended) as follows:

1. By adding a definition to § 40.5 to read as follows:

§ 40.5 Definitions.

* * * * * * *

Second in command. Second in command means a pilot other than the pilot in command who is designated by the air carrier to act as second in command of an airplane.

2. By amending § 40.261(c) to read as follows:

§ 40.261 Composition of flight crew.

* * * * * * *

(c) Where the air carrier is authorized to operate under instrument conditions or operate airplanes of more than 12,500 pounds maximum certificated weight, the minimum pilot crew shall consist of two pilots, one of whom shall be designated as pilot in command and the other as second in command.

§ 40.282 [Amendment]

3a. By adding a new sentence at the end of § 40.282(a) to read as follows: "A pilot qualifying to serve as other than pilot in command or as second in command shall demonstrate to a representative of the Administrator or to a check pilot his ability to take off and land each type of airplane in which he is to serve."

b. By adding a new paragraph (c) to § 40,282 to read as follows:

(c) Flight training for a pilot qualifying to serve as second in command shall include flight instruction and practice in at least the following maneuvers and procedures:

(1) In each type of airplane to be flown by him in scheduled operation:

(i) Assigned flight duties as second in command, including flight emergencies,

(ii) Taxiing,

(iii) Takeoffs and landings,

(iv) Climbs and climbing turns,

(v) Slow flight,

(vi) Approach to stall,

(vii) Engine shutdown and restart,

(viii) Takeoff and landing with simulated engine failure,

(ix) Conduct of flight under simulated instrument conditions, including in strument approach at least down to circling approach minimum and missed approach procedures.

(2) Conduct of flight under simulated instrument conditions, utilizing all types of navigation facilities and the letdown procedures used in normal operations. Except for those approach procedures for which the lowest minimums are approved, all other letdown procedures may be given in a synthetic trainer which contains the radio equipment and instruments necessary to simulate other navigational and letdown procedures approved for use by the air carrier.

§ 40.289 [Amendment]

5a. By amending § 40.289(b) by deleting the last sentence and inserting in lieu thereof a new sentence to read as follows "Where the check of the pilot in command or second in command requires actual flight, such check shall be considered to have been met by the checks accomplished in accordance with § § 40.302 and 40.305, respectively."

b. By amending § 40.289(c) by deleting the last sentence.

7. By adding a new § 40.290 to read as follows:

§ 40.290 Approval of training program.

The training program established under the provisions of § § 40.280 through 40.289 by the air carrier shall meet with the approval of an authorized representative of the Administrator: *Provided*, That the curriculum of such training program shall be submitted in appropriate form to an authorized representative of the Administrator not later than May 1, 1960.

8. By amending § 40.300(b) to read as follows:

§ 40.300 Qualification requirements.

* * * * * * *

(b) Check airmen shall certify as to the proficiency of all pilots being examined, as required by § § 40.302, 40.303, and 40.305, and such certification shall become a part of the airman's record.

9. By amending § 40.301 to read as follows:

§ 40.301 Pilot recent experience.

No air carrier shall schedule a pilot in command or second in command to serve as such in scheduled air transportation unless within the preceding 90 days he has made at least 3 takeoffs and 3 landings in the airplane of the particular type on which he is to serve.

10. By amending § 40.305 to read as follows:

§ 40.305 Proficiency check; second in command.

(*a*) An air carrier shall not utilize a pilot as second in command until he has satisfactorily demonstrated to a check pilot or a representative of the Administrator his ability to pilot and navigate airplanes to be flown by him and to perform his assigned duties. Thereafter, he shall not serve as second in command unless each 12 months he successfully completes a similar pilot proficiency check. The proficiency check may be given at any time during the month preceding or following the month in which it becomes due. The effective date of the check, if given within the preceding or following month, shall be the same as if given within the month in which it became due. Where such pilots serve in more than one airplane type, at least every other successive proficiency check shall be given in flight in the larger airplane type. The pilot proficiency check shall include at least an oral or written equipment examination, and the procedures and flight maneuvers specified in § 40.282(c)(1). The pilot proficiency check may be demonstrated from either the right or left pilot seat.

(b) Sebsequent to the initial pilot proficiency check for the second in command, an approved course of training in an airplane simulator which meets the requirements of § 40.302(b)(3), if satisfactorily completed, may be substituted at alternate 12-month intervals for the proficiency check required by paragraph (a) of this section.

(c) Satisfactory completion of the proficiency check in accordance with the requirements of § 40.302(b) will also meet the requirements of this section.

The provisions of this amendment shall become effective January 1, 1961, except as otherwise provided in § 40.290.

(Secs. 313(a), 601, 604, 605, 72 Stat. 752, 775, 778; 49 U.S.C. 1354, 1421, 1424, 1425)

Issued in Washington, D.C., on December 1, 1959.

JAMES T. PYLE,
Acting Administrator.

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[Part 40 last printed December 31, 1955]

Senator SMATHERS. Have you had any complaints from the copilots that they don't like this particular additional education that they have to undergo?

Mr. QUESADA. No, I think they like the idea of the standards being raised. They are as a group, sir, very, very serious minded conscientious, responsible groups.

Senator SMATHERS. I have another question and I will stop. I am taking too much time.

With respect to your regulation about retirement, compulsory retirement at the age 60, has it been your experience that all men who get to the age 60 or thereafter are not capable of performing the functions to which they have educated themselves to function?

The Chairman tells me—I withdraw the question—that you are going into that this afternoon.

Mr. QUESADA. Yes.

Senator MONRONEY. Two point on what the distinguished Senator from Florida quite well developed.

In the complaints that you have received concerning the checking of pilots in flight, has this not meant that they are checked perhaps oftener than was the former custom? I mean they are checked on the

same basis, but they are accompanied by inspectors perhaps at more frequent intervals?

Mr. QUESADA. First let me say that we haven't received any complaints except through the press. I have indicated we haven't received a single complaint. But we have in the press.

Senator MONRONEY. Are you checking them at more frequent intervals than has been the custom during the days when you were established in the basement of the Commerce Department and didn't have as many personnel?

Mr. QUESADA. Yes, I think we are. I think we are. And we should, sir.

Senator MONRONEY. Could this be perhaps one of the reasons why almost everyone has to undergo additional and frequent examinations? I know most Senators would not like to be put back to 2- or 3-year terms. We would like to have our tests at 6-year periods.

Mr. QUESADA. Senator, I think I should say, in order to be frank, that we are going to make these checks at an increasing frequency. As fast as we are capable of doing it, we are going to have these checks conducted by FAA people to a greater extent, and by company people to a lesser extent. As fast as we can do it.

Senator MONRONEY. I have heard by the grapevine, from pilots, that you have secret agents riding on the planes with stopwatches on their hands to observe how long the pilot has taken to go to the washroom. I wonder if there is any semblance of truth to the allegation that you have had these agents spotted unknown and unidentified in the passenger compartments to observe the absence of the captain from the cockpit.

Mr. QUESADA. Senator, I am embarrassed to answer the question. I understand that this has come to your attention through press notice as it has come to my attention.

Senator MONRONEY. And through general conversation.

Mr. QUESADA. It is so ridiculous and unwarranted that I hate to deny it, but I do deny it. I hate to dignify it by a denial.

Senator MONRONEY. There is this about this habit, shall we say, of a leisurely cup of coffee in the cabin for 500 miles or so of flight that there was a definite conflict, in many cases, between the direct regulation of the CAA, and now FAA, and the regulations or manuals of the airline companies; was there not?

Mr. QUESADA. You are absolutely correct.

Senator MONRONEY. The pilots were not developing this habit of their own initiative but the company directed, in most cases, that it was the duty of the pilot to "smooch" the customers and to get back and make them feel at home and to comfort nervous old ladies and things of that kind, or in flight explain that the wing wasn't coming off because they had had a slight bump in the air.

Mr. QUESADA. Mr. Chairman, I have to say with some embarrassment that this was in fact contained in company practices. And it was my letter to the presidents that asked them to stop this practice, and they complied without a murmur. They were most cooperative, and they realized thoroughly, and gave complete cooperation to the idea that a pilot must perform his duties.

I explained in great detail, in both letters, in all letters, that the public interest demanded this; the fact remained that we have a traf-

fic management system that isn't adequate for a pilot in any aircraft, commercial, or otherwise, to be able to put his aircraft on automatic pilot and be able to barge around the sky without at least seeing where he is going.

Furthermore, I might add, the general aviation group also gave me the clearest and the most effective cooperation on this.

I received a complaint from one group, only one: the Airline Pilots Association. And the letters you have in the record.

Senator MONRONEY. In relation to this there is nothing in the performance of new aircraft or modern development that would lessen the need of four eyes in the cockpit instead of two. This is the theory that you are to watch the gages, the meters, the valves and everything, and as well peer out of the cockpit window for approaching traffic in that neighboring area. Is that not still a rule that will always be true perhaps in aviation?

Mr. QUESADA. I can't think of any condition that would eliminate the necessity of a pilot seeing where he is going. I can't think of any condition that could occur.

Senator MONRONEY. And you still feel it is essential, other than for brief absences from the cockpit, to insist that on planes requiring two pilots, that those pilots be strapped in their seat ready at all times?

Mr. QUESADA. Ready to perform their functions, yes, sir.

Senator MONRONEY. One spectacular case we heard of concerning the absence of the pilot from the cockpit was in the nose dive of the 707 over the Atlantic. It is my understanding the pilot in charge at that time was not a regular commercial pilot in this sense—he was the vice president of the airline. He was serving at the time of a strike and was in command of the plane. Is that correct?

Mr. QUESADA. Sir, he had an ATR——

Senator MONRONEY. I am sure of that.

Mr. QUESADA. I assure you that I give no consideration to any individual's affiliation. I don't have any concern over his affiliation with one group or another. If he is serving in the public service I apply the rules. I don't care what affiliation he has.

Senator MONRONEY. If they are vice president or chief pilot they are the same in the eyes of the law and they must follow the regulations.

Mr. QUESADA. Yes, sir.

Senator MONRONEY. At this time I think we will recess, and we would like to resume our hearings at 2:30.

(Whereupon at 12:40 p.m. the subcommittee was recessed, to reconvene at 2:30 p.m., this day.)

AFTERNOON SESSION

Senator MONRONEY. The Aviation Subcommittee will resume its consideration of accident prevention and the history of accidents that was in progress this morning with General Quesada.

General, on page 23 of your statement you say—

We have also during this past year completed several intensive investigations of individual air carrier maintenance programs, going far beyond our normal maintenance inspection program, to make a full determination to the extent to which they comply or fail to comply with the maintenance regulations. In one

instance our findings with respect to a major air carrier and in subsequent discussions with that carrier resulted in reorganization of the company's facilities. We are at the present time discussing with another major carrier deficiencies which we have found in its methods of operation.

You dwell at length on that and I commend you for the attention you are giving to it.

Senator Smathers started in this field before we were compelled to recess for lunch.

I wonder if you have found the carriers willing and ready to comply with improved techniques and methods of inspection and certification of current work and things of that kind?

Mr. QUESADA. Senator, it might be appropriate just to go through quickly a thumbnail sketch of the events. In this particular case it came to our notice that there was an undue number of violations. As a matter of fact practice and principle. It does not make us happy just to file a violation report. I am not twice as happy if there are 10 than as if there were 5.

As a matter of principle, we would like to get to the root of the trouble rather than correcting each instance as it occurs.

In this particular case, there was, I will have to say very frankly, an inordinate or unusual number of violations being filed. We sent a team into this particular area and they came up with a report. This resulted in the action to which you refer and I have referred.

The company took action, very definitely. It took concerted action. And I must say, since then, Senator Monroney, I think the violation reports have gone to zero.

Senator MONRONEY. That is on this particular company?

Mr. QUESADA. On this particular company. Although our inspection program continues, the fact remains that the violation reports have gone to zero.

Senator MONRONEY. This would not indicate, however, that other airlines or carriers have necessarily brought their maintenance up to the standards that you are seeking to insure, would it?

Mr. QUESADA. Of course, Senator, I think it is fair to say that they could almost never bring them up to the standards that we would like to have, because the standards that we would like to have would be no mechanical deficiency. That is obviously too much to ask. But in one other company we have taken the same action and we expect the same result.

Senator MONRONEY. For instance, one of the major air carriers, I think last week in a span of 48 hours, had two landing gears collapse and one runaway propeller. Would this indicate just a happenstance of a grouping of these disorders or some failure in the inspection, maintenance, or checklist system of this aircraft?

Mr. QUESADA. Clearly a rapid sequence of accidents such as you have referred to, suchas I am aware of, arouses more than our interest. When things like that occur, we put added emphasis on our inspection program.

In this particular, this particular company has a fairly good if not a good maintenance record. However that doesn't mean that we don't step up our activity. I want to add again that we try to go into preventive measures rather than picking up the pieces afterward.

Senator MONRONEY. I understood after that this series of incidents that all of their planes were placed on jacks and were tested, every plane in the company's fleet, to determine whether the landing gears were operative. One, I think, at least, or perhaps more, were found not up to perfection.

You are on notice usually, are you not, when there is a landing gear difficulty?

Mr. QUESADA. Oh, definitely. I think it might be appropriate to indicate the extent of on notice.

On minor things we are informed.

Mr. PUTNAM. On these two landing gears you speak of, those resulted in major damage. We got immediate notice on those and instituted immediate corrective action, which was a fleet inspection of all of these landing gears.

Senator MONRONEY. That was by your order?

Mr. PUTNAM. Yes, sir.

Senator MONRONEY. It was done immediately?

Mr. PUTNAM. Yes, sir. We accomplished that through our own people without waiting to go through all the rulemaking procedure. It was done immediately.

Mr. QUESADA. Senator, the airplane is a very complex device, and is becoming more and more complex as you know better than most people, certainly better than I do or as well as I do. We shouldn't expect everything to function all the time.

There is case after case after case where malfunctions bring to our attention corrective measures. And in many cases we take the corrective action in hours, by direction.

Senator MONRONEY. Earlier, when Senator Smathers was interrogating you about the flight recorders, you mentioned how valuable they were; not only in accidents but for proper maintenance. If these recorders or more modern versions thereof, were a part of the requirements of equipment on all transport aircraft, even below the 25,000 feet where they are now required, they would be perhaps the most valuable single adjunct of testing in nonaccident cases. They would show evidence of malfunction of various parts, or test the g-strain of a hard landing or excessive speeds or characteristics of bad engines, would they not?

Mr. QUESADA. They would, and, Senator, with the present state of the art in weaponry development wherein recording of events is extremely important, we have developed a great ability, this country has developed an unusual ability to develop devices and means of detecting the events that have occurred, and recording them.

With the present state of the art I am convinced it is reasonable and practical to develop a recorder with more than 5 channels of information, with up to 20, maybe 30, maybe 50.

Senator MONRONEY. I think there are some now being used on jet planes. If I remember correctly, they have 34 various items recorded.

Mr. QUESADA. This is not beyond reason today. Much of these data could provide a quick read-out that could be available to the operations or maintenance people 30 minutes after arrival at terminal, which could indicate graphically the history of the flight in which certain excesses or certain difficulties—I say excesses not meaning to be mean—excesses do occur, and it would be well to have some way

of pinpointing these excesses immediately after arrival at terminal. And I think that this is now very reasonable.

Senator MONRONEY. And that hard landings or anything that might put undue stress on the plane would be immediately available when the recording roll was taken out of the recorder.

Mr. QUESADA. And immediately applicable. And it would assist the airlines in the accomplishment of their mission, and it would go far and beyond the determination of probable cause after the accident. It might well contribute to a history of what has taken place to engage in preventative measures rather than curative measures.

Senator MONRONEY. You would be willing to say that as soon as an improved, modern, working flight recorder is thoroughly tested at the research and development laboratories in New Jersey, that you will issue flight regulations or air safety rules requiring these in all or almost all transport planes?

Mr. QUESADA. I am convinced that we are going to go beyond the present rules, or I will say that we are going to go beyond the present rules; and require flight recording beyond that which is now required.

Senator MONRONEY. And for aircraft which fly below the 25,000, because by great good fortune or good luck, or good flying, our accidents so far above 25,000 feet have been zero, I believe.

Mr. QUESADA. One of the objectives, Senator, of this program in particular, is to reduce the human failure. When I have recited that 50 percent of our accidents in some way can be associated with crew, I don't mean this to be critical of the crew. I mean to establish clearly that the human link is the weakest link in our whole program.

This is my point.

Senator MONRONEY. It can be weak on the ground as well as in the air or in the front office if there is failure there to provide the proper maintenance personnel.

Mr. QUESADA. That is correct.

Senator MONRONEY. So safety is a combination of every element of human endeavor, is it not?

Mr. QUESADA. It is.

Senator MONRONEY. It would be useful, I presume, in perhaps even modifying structural changes that might be necessary if these planes were required to have flight recorders; is that correct?

Mr. QUESADA. I am convinced that within the present state of the art we could have a flight recorder that could give us data on engine performance, could give us data on exactly when did ice form, at what time, where were you then, how fast were you going, and what was your altitude. I think that there is a broad avenue of exploration that could give us a great deal of information that can reduce the human error on one side and provide the airlines with a source of knowledge that otherwise would be denied to them.

Senator MONRONEY. Getting down to the human element in the maintenance department, pilots, I understand, and flight crews, are required to pass periodic check examinations and check runs. What is that period?

Mr. PYLE. Every 6 months.

Senator MONRONEY. That is a physical?

Mr. QUESADA. For the captain in command, every 6 months.

Senator MONRONEY. Is that both flight and physical?

Mr. PYLE. That is correct. Proficiency check and medical examination.

Senator MONRONEY. How often is a mechanic or a specialized maintenance man who is a certificated and licensed airman on planes, how often is he required to pass a proficiency examination?

Mr. WELLING. He is not required.

Senator MONRONEY. Once certificated, always certificated, unless he does something which would require revocation of his license?

Mr. WELLING. That is correct.

Senator MONRONEY. Have you ever given any thought to the significance of changes of techniques? As we move from reciprocating engines to jets or prop jets, there are different techniques, perhaps, in this art of repair and maintenance of a completely different type of powerplant that might require additional proficiencies and additional skills possibly beyond the competence of an individual who was certificated on an older type engine?

Mr. WELLING. Yes, Senator Monroney, we have given this serious consideration. We are trying to develop new regulations to take this into account, and among things we have is requiring renewal of the certificate every 12 months based on the experience as indicated by the man's record.

Senator MONRONEY. You mentioned training of flight crews for familiarization with new equipment. Have you insisted, also, that the airlines have that in their maintenance shops, that they have training schools for these new tasks and new jobs that are comparable to the requirements to at least the degree required for mechanical maintenance?

Mr. WELLING. The regulations do require that the airlines provide training for their maintenance people, and the training program is submitted to us.

Senator MONRONEY. You do not now require certification or examination in these new fields—that these new fields of competence require?

Mr. Welling. That is correct.

Senator MONRONEY. But you are considering that as a possible field that might lead to insuring greater familiarity and acquaintanceship and knowledge with the many new things that undoubtedly occur, is that correct?

Mr. WELLING. That is correct.

Mr. QUESADA. And it has been accented by the substitution of the jet engine for the reciprocating engine.

Senator MONRONEY. And it will be probably further accelerated when you bring in the turbofan. It seems to me it is a constant changing source of skills and qualifications as each new thing comes in, and it would require almost a continuing training program for this maintenance.

Mr. QUESADA. That is correct.

Senator MONRONEY. As I said, you had either great good luck or good fortune, or awfully good flying in your jet program. It seems to me, and perhaps it is merely coincidental, that there have been more mechanical failures in the older aircraft and the accident rate has certainly climbed among the older aircraft.

I wonder if by any chance they have devoted so much attention to the new baby in the family to be sure that it was warm and well kept and well groomed, that they have neglected the older children and maybe they are not getting quite the proper attention and care that they once received when they were the queens of the fleet.

Mr. QUESADA. I can't put my finger on any such trend, but I think it is only fair to say that the injection of the straight jet airplane has certainly taxed all of these companies that have them. It is no easy task to put this airplane into operation.

Senator MONRONEY. I am sure of that. I wondered if in doing that it might have drained off skills and attention to supervision that once was devoted exclusively to reciprocating engines, and may be responsible in some degree to some of the more frequent mechanical failures that we have experienced, or at least must have been experienced in the building up of the accident rate this year.

Mr. QUESADA. This could be, Senator.

Senator MONRONEY. You are doing everything you can with increased inspection?

Mr. QUESADA. Yes, sir.

Senator MONRONEY. You say that you went around the clock on the pilot checks. Have you increased the overtime of your plant inspectors and people working in this field of ground maintenance as well?

Mr. QUESADA. In two particular cases to which I have referred we have increased the activity to a very marked extent by sending a whole crew out to the operation and submitting a very, very substantial and documented report upon which we acted. We acted quickly upon the the receipt of this report.

In the latter part of last year I am aware of a similar action that Mr. Pyle took as Administrator of the CAA. It was an action of a similar character. Am I right in saying that?

Mr. PYLE. Yes.

Mr. QUESADA. He took very, very concerted action in one particular case where it was apparent to him that this action was essential.

Senator MONRONEY. I believe you referred in your statement to the valuable help that the military is giving you on the KC–135, and that you have qualified 14 of your air carrier inspectors on the jet check-out, and now are competent in flying the airplane, is that correct?

Mr. QUESADA. Yes, sir.

Senator MONRONEY. And you have 14 other inspectors assigned to the same school, receiving training in helicopters and other things as well. My question is, Do you have in your own staff of mechanical inspectors men who have been checked out on jet maintenance and who have gone through eithed the military schools of maintenance—jets, engines, and other things—or are they merely getting it from book knowledge?

Mr. WELLING. Senator Monroney, they have received training for the most part at the plant of the manufacturer of the airplane and they have in general participated in the same instruction that the employees of the air carriers who procure the airplanes receive.

Mr. QUESADA. To put it another way, we have purchased in some cases from the aircraft companies a course of instruction for our

maintenance inspectors. They have gone to the factory and taken a course of instruction quite similar, if not identical, to that that they give the various companies which are going to receive these planes.

The various companies which have purchased these planes send their maintenance personnel to the aircraft manufacturer for instruction in that aircraft, and we have sent our inspectors to the same course.

Senator MONRONEY. You would say then that your mechanical inspectors on ground facilities are as competent in their jurisdiction through schooling in late developments, and through the factory training, as your flight inspectors would be with their experience in the KC–135 and other jet aircraft?

Mr. QUESADA. We are adopting the same principle, I should say, yes.

Senator ENGLE. May I ask the chairman to yield?

Senator MONRONEY. Yes, sir.

Senator ENGLE. I would be a little presumptuous, I think, if I just got out of check school in a Boeing 707 and walked in on a pilot who had flown it hundreds and hundreds of hours and undertook to sit in the cockpit and tell him whether he was doing it right or not. It is like a fellow getting a brandnew spanking license, walking into an airplane and telling some fellow who has not only held a private license but operated it for several thousand hours, telling the fellow who is doing it for several thousand hours that he was flying it wrong.

It seems to me this poses a very difficult problem. I don't see how you are going to get inspectors who are competent to judge whether or not men who have more competence than they have are really competent. How do you do that?

Mr. QUESADA. I have tried to bring this out, Senator Engle.

Senator ENGLE. I am sorry I wasn't here. Mr. Chairman, I had another engagement. I was unavoidably away. I am intensely interested in this matter. What I am trying to find out is how you get inspectors in there who know what they are talking about. They may be talking to an air transport pilot who was flying when they were in swaddling clothes. So he walks in with his nice new shiny certificate and says, "Old man, you are doing it wrong."

Mr. QUESADA. In the first place, Senator, they don't say that.

Senator ENGLE. You are sure they don't?

Mr. QUESADA. Yes, sir, I am sure they don't.

Senator ENGLE. That is another question I want to get to, and that is the attitude of these people. I think it is important to know whether or not we are setting up a gestapo that sneaks around these airplanes and operates as a snooper corps, aggravating the captain. I notice mentioned that a captain tossed one of those out of the cockpit. That was his privilege, wasn't it?

Mr. QUESADA. No, sir, it was not. He was in violation when he did.

Senator ENGLE. He is in command of that airship, isn't he?

Mr. QUESADA. Yes. But if he does not permit access to the cockpit, of our inspector, he is in violation, and a violation report has been submitted.

Senator ENGLE. All right. What if that fellow is making the pilot nervous?

Mr. QUESADA. Oh, Senator, I don't think he is making the pilot nervous.

Senator ENGLE. Do you want some fellow standing around looking over your shoulder when you are sweating out an approach that is just bare to the minimums? Do you want that?

Mr. QUESADA. If the presence of our inspector is such that a pilot would be so nervous that he can't manipulate his airplane, I would say that he was not a very good pilot.

Senator ENGLE. Do I understand then that you have abrogated the rule that a captain in charge of an airplane is no longer the captain of the plane; he is captain of the plane subject to the FAA inspector coming in and cluttering up the cockpit and giving him a lot of chatter when he is trying to hear six radio stations at once and be sure that he is getting his holding pattern right; and there is a copilot and somebody working with a library—that is what it takes now to fly one of these machines.

Mr. QUESADA. You have asked so many questions I don't know which one to answer first.

Senator ENGLE. All right, go back to the first one, and I will come on down through the line. What I am concerned about is the competence of the inspectors who are inspecting the professionals. If I came out of an instrument course, for instance, with a brand spanking new, name on it signed "General Quesada" which says I can fly instruments, I would be a little reluctant to get into a cockpit and tell some instrument pilot that he hadn't boned up on the case recently.

Mr. QUESADA. Let me try to go to this point——

Senator ENGLE. I recognize this is a practical problem. I am not being critical about it. What I want to know is how you solve it.

Mr. QUESADA. I will try to tell you, Senator.

We have sent, as I have indicated, 14 of our personnel to the Air Force school at Castle Air Force Base in California where they underwent a course of instruction the likes of which does not exist any place else in the world, for the simple reason that the military establishment can afford facilities that other groups cannot.

In this school they underwent a course of training identical to that which the Air Force imposed upon their own personnel who are themselves qualified in the KC–135 tanker.

This is a very comprehensive course of instruction with a very highly defined curriculum, administered by very well qualified personnel who are devoted and dedicated to the simple practice of training. They become qualified in this airplane.

They are qualified in this large jet transport airplane. The KC–135 is indentical in almost every form to the 707. These people have been in every instance, with the exception of the first few, the people who have checked out the pilots on 707's. I don't think there was a single one of them who wasn't at least as qualified if not more in this type of airplane than the person they checked out.

Senator ENGLE. I would assume they would have to be.

Mr. QUESADA. They also went to the Boeing school to get further understanding of the system of a 707. So therefore I have to say to you, sir, that they are just as qualified, if not more so, than the pilot they are checking out.

Senator ENGLE. How many 707 pilots over 60 years of age are you going to ground here in the next few month?

Mr. QUESADA. Sir, the rule which has been published, to be effective March 15, will specifically provide that all pilots over 60, sir—all airline pilots over 60— will not be able to perform that function.

Senator MONRONEY. If the Senator would permit: We have a whole space of several days reserved for that particular question.

Senator ENGLE. I understand that. I am not going to get into it, except I want to suggest to the general that he might make these airline pilots a little happier if he would tell those fellows over 60 that they might be pretty good inspectors with his organization, having flown for many years, and being otherwise qualified.

Mr. QUESADA. Sir, I would love to have many of them, and I have spoken to at least some. I would love to have many of them. They would serve us a very, very useful purpose. As a matter of fact, one of them works for us now, and I have to say to you very frankly he is indispensable to us. He is indispensable.

The function this man is serving to us is tremendous. And so would many of the others.

I would love to have them. Love to have them.

Senator MONRONEY. Did I understand you earlier, to state that approximately 75 percent of the checking of pilots is done by the chief pilot of the company, who themselves are all old airline pilots of great seniority and competence?

Mr. QUESADA. To be more precise, Senator Monroney, what you say is true but it should be added that they are designated check pilots. We have designated them to be the ones to conduct the check on the pilots of their company.

Senator MONRONEY. What percentage of your check rides are by the company-designated chief pilots?

Mr. QUESADA. Approximately 80 percent.

However, all the checks, 100 percent of the checks that are being conducted on the large jet transport, we are conducting.

Senator MONRONEY. So there is very little accumulation of experience on that particular plane that is new at the moment; is that correct?

Mr. QUESADA. We have at least as much experience as they do. I might add, there is another innovation that we are going to put into effect as soon as we possibly can. At one of our field locations we are setting up a stable of aircraft, or attempting to set up a stable of aircraft similar to the aircraft that are in service. It is our intention to send through this location our check pilots on a rotating basis so they will have to go back, fly the airplane under a rigid curriculum, and pass a test themselves.

However, they will not be subjected to this test by the people for whom they work. Therefore, we are applying to ourselves, to our own check pilots, the same standards that we are applying to the airline check pilots. They will have to pass their test in order to qualify as a check pilot.

Senator MONRONEY. Excuse me for interrupting.

Senator ENGLE. Are you through?

Senator MONRONEY. Yes. I was merely trying to clarify this one point.

Senator ENGLE. I assume this phase of the hearing, Mr. Chairman, relates to the matter of airline safety?

Senator MONRONEY. That is correct.

Senator ENGLE. And that you prefer to avoid other matters?

Senator MONRONEY. We don't wish to avoid it, but we think probably more orderly hearings could be held if we confine the categories because this field is so large and there are so many subjects we wish to take up.

Senator ENGLE. I understand that and I will try to conform to the chairman's wishes on it, although yesterday we got into matters involving private pilots, and we will get into those again.

What I would like to ask you is what level of safety in the flight of commercial aircraft are you trying to achieve. Do you have some objective?

Mr. QUESADA. I have said in my statement that I would like to have a commercial flight in service accident free.

Senator ENGLE. I read that. That is why I asked the question. I suppose the people who manufacture bathtubs would like to have a bathtub operation which was accident free.

But human experience is that so long as there are bathtubs around people will fall down and get hurt in them, and we are not going to eliminate all bathtubs just because we think we ought to have a 100-percent-accident-free record in the use of bathtubs in the home.

What I am saying is this: That the way to make all air traffic 100 percent safe is to put all airplanes on the ground. I think some way or other you can carry this business to the point of absurdity.

If you are driving at a completely accident-free record, which may be all right as a nebulous objective, but, after all, you don't expect to achieve that, do you?

Mr. QUESADA. No, sir. As a matter of practicality, of expectation, I don't. I explained this to Senator Monroney before you came in. Obviously, though I would like it, I wouldn't expect it to occur.

Senator ENGLE. It is your view, is it not, that over the years, in spite of the changes that have occurred very rapidly in the field of aviation transportation, the numbers of deaths from airplane accidents per passenger mile have gone consistently down. Is that right?

Mr. QUESADA. Generally speaking it fluctuates from year to year, some years up and some years down from the previous year.

Senator ENGLE. Do you make any distinction between the standards of safety which you undertake to impose upon commercial carriers and those that you undertake to impose on noncommercial flying in aviation, of one kind or another?

Mr. QUESADA. I might have my legal counsel read the statutory requirement, which is a mandate from the Congress. This might answer your question. Would you like to have it read?

Senator ENGLE. That doesn't impress me particularly, but read it.

Mr. QUESADA. It impresses me tremendously because those are the rules under which I operate.

Senator ENGLE. Many a speech is made in the form of legislation. Go ahead.

Mr. HOWARD. This is it:

In prescribing standards, rules, and regulations, and in issuing certificates under this title, the Administrator shall give full consideration to the duty resting upon air carriers to perform their services with the highest possible degree of safety in the public interest, and to any differences between air transportation and other air commerce.

Senator ENGLE. Tell me in plain language what that means?

Mr. HOWARD. That means that Congress has specifically directed the Administrator to give the very thing you mentioned, a higher standard of care and treatment to air transportation than to other forms of commerce.

Senator ENGLE. You are speaking of the airline passenger carriers?

Mr. HOWARD. Air transportation is defined in the act as essentially, common carriage transportation for hire. I mean for this purpose that would be the distinction.

Senator ENGLE. You could apply the same rule, then, to cargo planes that you apply to passenger planes?

Mr. QUESADA. This would be so.

Senator ENGLE. But you do recognize that there is somewhat less of an obligation, do you not, General, on the Federal Government or any Government agency with reference to the carrying of passengers for hire, and the private pilot who gets out here and cranks up his flying machine and gets off the runway all by himself?

Mr. QUESADA. We do.

Senator ENGLE. As I understand, you intend to keep that distinction in mind?

Mr. QUESADA. Because Congress has told us to do so.

Senator ENGLE. We would hope you would do it just as a matter of commonsense if the Congress hadn't said so.

I want to inquire a little about this rulemaking authority that you have. I am a little distressed by any kind of a program that lets any man in this country write on a piece of paper and what he writes becomes the law, subject to the imposition of criminal penalties.

That violates my basic concept of Anglo-Saxon jurisprudence. I recognize that we have to have some rulemaking authority. What I want to find out is who is watching the rulemaker.

In other words, do you have unabridged, unequivocal, and unlimited authority to make any rule that you want to make?

Mr. QUESADA. I would say the answer to that is "No." If the rules that we should write were capricious, as an example, the courts would strike them down if anybody wished to describe them as such.

Senator ENGLE. I have been around the courts a good deal, too, and I have found out that courts are reluctant to interpose themselves in an area where an administrator has been given wide authority.

May I see those two articles in the Pilot magazine?

I understand that you can promulgate a rule. For instance, you can say to the air carriers of America, "You have to have a recording device in the airplane." You can say by rule to the air carriers of America, "You have to carry weather radar."

Mr. QUESADA. That is correct.

Senator ENGLE. And they must comply with that. Give me the procedure on how that rule becomes effective. Let's assume you think of it one night laying in bed just before you went to sleep, and you go down the next morning and write it out on a piece of paper. Now what happens to it?

Mr. QUESADA I won't concede that that happens. I think it might be more responsive to your question—you have asked a legal question and I think my legal counsel can answer it more thoroughly than I.

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Senator ENGLE. You know the procedure that is taken up.

Mr. QUESADA. I do know the procedure.

Senator ENGLE. You have to have a hearing. You publish it, don't you?

Mr. QUESADA. We have to publish a notice of rulemaking, and we do. Unless there is an emergency that requires us or permits us to implement a rule without this procedure. We can do that.

Senator ENGLE. After you have published the notice that you intend to do this to these people, what can they do about it?

Mr. QUESADA. The notice is put in the Register, the Federal Register, which is the Government's method of informing the public. They have the opportunity, any person or group of people have an opportunity of responding and commenting on the proposed rule.

Senator ENGLE. Let's assume that having slept on this, you have it firmly in your mind, but you intend to go through the necessary procedures and you do go through them with your mind thoroughly closed, like somebody said about Senator Taft's mind one time. They said it was like a steel trap, it had snapped shut 20 years ago and had never been opened since.

Let's assume that your mind had snapped closed on that subject, and after all, everybody protested, and you nevertheless insisted on putting the rule into effect. Then what recourse do these people have who claim that this is an unreasonable requirement to place upon the air carrier as a safety measure?

Mr. QUESADA. You said "let us assume." I will not assume this because it doesn't take place. However, if——

Senator ENGLE. No. I want to read you a statement from this article called Dictatorship which you put in the record, and from your statement you recited the existence of it with some degree of umbrage, I thought. It says:

> Mr. Quesada is friendly and understanding, but the next man may not be, and the abuses could treble overnight.

That comes from a very high source, that statement, and is extremely complimentary to you. Let's assume that the next man isn't as this editorial "Dictatorship" describes you, "friendly and understanding," which is a complimentary reference to you. Let's assume that some other fellow is not.

What I want to find out is what the average fellow can do about it. Does he have any appeal at all?

Mr. QUESADA. Let me first say that this editorial attributes to me an accolade that I don't find pleasant.

I assume full responsibility for everything the Agency does. I am its Administrator. I don't want to be separated from the employees. I don't think that they are any less objective than I am, or any less subjective than I am, or more subjective. I assume all the responsibilities of the Agency. For me to be separated in a favorable light as compared to them in an unfavorable light I think is unkind. However, everybody has the right to their own opinion.

Now, in respect to the substance, we have the Administrative Procedure Act, which has been in effect since 1946, and we conform to it.

Senator ENGLE. I understand that.

Mr. QUESADA. And so will every other Administrator after me. If he doesn't, he can be hauled into court. Every person who doesn't like our rule has that right.

Senator ENGLE. I understand that. But all the Administrative Procedure Act requires is that you give the necessary hearing and that the people be heard. It is like the times I used to go down to the Federal Trade Commission and plead for this and that, and they never even wrote the record up. I finally got tired of going.

After you get all through, what is left? Do you have it in your power, an undivided discretion to impose a rule. You make the decision?

Mr. QUESADA. In the final analysis, I have to say—I guess the answer is "Yes." I am subject to court review. I have to conform to certain practices as prescribed by the Administrative Procedure Act.

Senator ENGLE. I understand the Administrative Procedure Act. It is just a series of legal hurdles that an administrator must necessarily put up with sometimes in order to get what he wants done. What I am trying to find out is whether or not we have any place to go other than to the desk of the Administrator of the FAA if all this is exhausted and we still think the order is unreasonable and burdensome and is not in fact conducive to air safety.

Mr. HOWARD. I would like to point out to you, Senator Engle, that the Administrative Procedure Act applies to all rulemaking activity; virtually all rulemaking activity of the Government. Many other Government agencies have the same authority we have.

I might point out, in addition, that the same authority to regulate the safety practices of transportation exist in many other agencies of the Government. They, too, are subject to the same identical procedural requirements that are set forth in the Administrative Procedure Act.

Senator ENGLE. The fact that there are a lot of them doing it doesn't sanctify it in my mind. What I am thinking of is where do you go. You ought to have a place to appeal the reasonableness of a decision, it seems to me, outside of the Administrator himself. Is there such procedure?

Senator MORTON. Would the Senator yield?

Senator ENGLE. Yes.

Senator MORTON. If, in the application of these rules, a man loses his pilot's license, let's say, doesn't he have the privilege of appealing that to the CAB first?

Mr. HOWARD. This is correct. I think it is very important to bring out a distinction between the issuance of the rule itself and its application to an individual. The issuance of a rule is very similar to a legislative act of Congress. It is an extension of this authority——

Senator ENGLE. That is exactly the point.

Mr. HOWARD. Which you have bestowed upon the Administrator. In the application of the rule or standard to an individual, this is something akin to a judicial proceeding. In this case there is an appeal to the Civil Aeronautics Board from an action by the Administrator.

Senator MORTON. If the Senator will yield further: If that appeal is against the pilot, or whoever is bringing the litigation, he can still go to the courts?

Mr. HOWARD. This is also true.

Senator MORTON. In the case of the Coast Guard, for instance, which takes away a master's or a mate's papers for some infringement of rules they make; does he have anything similar to the CAB to appeal to?

Mr. HOWARD. I don't believe so.

Senator MORTON. He goes directly to court?

Mr. HOWARD. I believe so.

Senator MORTON. Actually, we have more safeguards than we have in any other rulemaking agency of the Government.

Mr. HOWARD. I agree with Senator Morton.

Senator ENGLE. I am sorry to disagree.

Senator COTTON. On that point, what is going on in this room today is an appeal to this committee by interested parties to have this Committee review and consider whether the rulemaking authority has been properly used and whether there should be new legislation. If this isn't an appeal, then I don't know what is. I still have some confidence in the Congress and in this committee to oversee this.

Senator ENGLE. So do I. That is why I am attending these hearings.

Senator MONRONEY. Will the Senator yield for a further clarification?

Senator ENGLE. Yes.

Senator MONRONEY. The authority of rulemaking which today you exercise and which on human rights allows an appeal both to the CAB and to the courts, is merely a continuance of the old authority that existed since the original CAA Act under which the Civil Aeronautics Board had the safety rulemaking power and the same degree and the same categories is now lodged in you. The only additional thing is that when it involves human rights there is an extra appeal granted by the Federal Aviation Act, with which your magazine editor is not in agreement. Certainly this is an added appeal that is in there that wasn't in the old act.

Further, a person has the same appeal to the courts. The rulemaking functions that are necessary in a fast-moving, dynamic industry such as aviation cannot be exercised by the Congress. I believe in the Congress as much as the Senator from California, but I don't believe we are quite competent to say what kind of a weight load and how much gas and the speeds of a jet on takeoff and the minimum runway lengths under certain atmospheric conditions and temperature should be provided. This has to be passed on to those technically competent to evaluate for the safety of the public.

Senator ENGLE. I am not quarreling with the rulemaking. I am quarreling with the absence of any way to get an impartial review of it outside of the agency which promulgated it.

In response to my friend from Kentucky, if a man goes before the CAB, he doesn't go before the CAB on the question of whether or not the rule is right. He goes before them as to whether or not the evidence sustains his violation of the rule as made.

When he goes before the courts, he doesn't go before the courts to challenge the basic propriety of the rule, unless it is arbitrary and capricious. He goes before it only on very limited grounds, either factually the charge wasn't sustained or there is an outside chance the rule was arbitrary and capricious.

What I want to ask you, General, is this: Would you have any objection if the rulemaking authority, which now resides in you, were subject on appeal by appropriate interested parties to the CAB, so that the sanctity, the justice, and the justification of the rule itself can have some kind of review before a general public body?

Mr. QUESADA. This issue was raised when the act was considered, and the Senate and the House, or the Congress, saw fit to write the rule the way it is, after giving due consideration to this proposal that you make.

Senator ENGLE. I am familiar with that history. But I am asking you whether or not you would have any objection if that thing was changed, assuming that some of us think that that was a mistake?

Mr. QUESADA. I would take the same attitude now as I took then, on the ground that it would just unnecessarily delay, in a field of public safety. I would oppose it now as I did then.

Senator MONRONEY. Would the Senator yield?

Senator ENGLE. Yes.

Senator MONRONEY. Would he want all rules, those dealing with equipment and safety and inspection of aircraft and methods of operation of the aircraft, also appealed to the CAB?

Senator ENGLE. I just don't know. I haven't formulated this situation in my mind completely. What I am opposed to, and fundamentally opposed to, is the power of one man to write on a piece of paper and have the effect of binding law, subject to criminal penalties. I think somehow or other we have abandoned something in the American system when that kind of thing occurs.

Later on when we get into this business of private pilots I want to talk to you about the way the FAA sends them letters and say "Pay $50 or we will take you to court." That is another matter that is outside the realm of this particular phase of the hearings. What I am talking about now is the uninhibited authority of the Administrator to establish requirements of great importance, to a large segment of the industry, and dependent solely upon the final decision of one man.

Mr. QUESADA. It isn't uninhibited, Senator. But there is one point that you asserted that must be corrected and it must be corrected now.

Mr. HOWARD. You have asserted that these are subject to criminal penalties, these violations. This is not so. There are separate criminal penalties in the act, but they are not applicable to violations of the safety regulations. The only sanctions in the act for violations of the safety regulations are suspension and revocation of certificates or a so-called civil penalty.

Senator ENGLE. That is a fine distinction, but when they sentence me to a $100 or 50 days in jail——

Mr. HOWARD. There is no such penalty.

Mr. QUESADA. There is no such penalty. I am trying to correct that.

Senator ENGLE. I understand that. But the imposition of a fine—that is what this amounts to—or even worse, pulling an airline's cer-

tificate, imposes penalties that are often worse than the ordinary fine you get down here in a criminal court.

Senator MONRONEY. To correct the record, did you say airline certificate?

Senator ENGLE. The operating certificate.

Senator MONRONEY. You mean airman, not airline.

Senator ENGLE. No, I mean that they can ground the airline if they don't meet the requirement. In other words he can require a radar in the cockpit of an airplane as big as that table, and there isn't anybody in this room who could stop him if he wanted to do it. And the airlines could kick about it but they would either put it in there or put their airplanes on the ground. That is what I am talking about. That proceeds on the signature of one man. I protest that. I say that that kind of regulation ought to be subject to some kind of review some place or other in some public body; outside the Congress.

Mr. QUESADA. It seems to me that when the Senate and the House passed the law, as they did, they assumed that an Administrator would be selected who was at least prudent, and furthermore, if they had any doubt about the person, they didn't have to confirm him because the Administrator is appointed with the advice and consent of the Senate.

Senator ENGLE. What if we find out that you are imprudent, and you are already confirmed. There is no way to get you out as far as I know.

We thought well enough of you to confirm you. But a lot of people may change their minds. The act as written—it isn't the law handed down from Mount Sinai and might be subject to some improvement. That is what I am talking about.

Mr. QUESADA. If we implement a rule that can be classified as imprudent, the courts can strike it down.

Senator ENGLE. The courts can strike it down only in case they find it unreasonable or capricious. Anybody who knows anything about courts knows that the courts are extremely reluctant, because this is a fuzzy land, the edges are very unclear as to where an act becomes unreasonable or capricious, especially in technical fields. That is why it seems to me there ought to be some review.

I understand that you are opposed to that, and you will oppose legislation introduced for that purpose?

Mr. QUESADA. Sir, as far as the courts are concerned, I, as a citizen, have to assume that the courts will perform their due function. I hold the courts in high regard. If anybody feels that we are either capricious or unreasonable I think the courts will be very considerate of such a charge and will give proper and judicial decision on it. I hold them in extremely high regard.

Senator ENGLE. Anyone who has ever read the decisions where courts have been asked to intrude their judgment and declare an act of an executive agency as capricious or unreasonable, will find that they skirt the edges pretty carefully.

There was one other thing in your statement that interested me, General, a good deal; and that is you inveighed at some length against these so-called special interests. Is that what you called them?

Mr. QUESADA. Yes, I did.

Senator ENGLE. The special interests as you identify them are the airline pilots and the other pilots of the country. Is that right? And perhaps?

Mr. QUESADA. I haven't identified them, Senator.

Senator ENGLE. You didn't identify them?

Mr. QUESADA. No, sir.

Senator ENGLE. But they are who you are talking about?

Mr. QUESADA. Sir, I have gone to great pains to avoid making this personal, and I hope that I may continue to do so. It is my hope, sir, that these groups which have for reasons of their own that I don't quite understand, which have assumed these tactics, it is my fondest hope that they will join in constructive criticism and help us in our most difficult task. Many of these groups are extremely helpful groups. We would have a very difficult time getting along without their cooperation. We appealed to them repeatedly over and over again for assistance, and will continue to do so.

It is my fondest hope that some of these groups that have engaged in these destructive tactics and destructive to public confidence will see what I am attempting to accomplish and join in a constructive effort to improve public safety.

Senator ENGLE. It might occur to you, General, that if you do a little better job of selling the case with people who are intimately concerned with this business that they wouldn't be so destructive about it.

The two editorials you put in the record were in the Pilot magazine published by the Aircraft Owners & Pilots Association. One of them I quoted from, which I didn't regard as unfriendly particularly to you.

Mr. QUESADA. I have tried to draw that distinction, that I am not personal about it.

Senator ENGLE. This says, "dictatorship." I would like to suggest, General, that if you had been in public as long as some of us have, a mean editorial now and then is in due course. You ought to expect it, and you ought not to be too thinskinned about it.

This is a serious matter because if this situation continues, here is what I am afraid of, and that is that these airline pilots and the other pilots throughout the country are going to get the idea that the FAA isn't for them at all; that the FAA is rubbing their noses in the dirt; and you are not going to get cooperation from the very people who can achieve air safety.

You cited two or three examples in here of airline pilots; one of them acting like he is going to sleep, and the other told the FAA inspector to get out of the cockpit, and another fellow was highly negligent in his attitude, saying that if he didn't use a checklist when the inspector wasn't there he wouldn't use it when the inspector was there.

Those illustrations, I would think, would be exceptions. But I would also think that they might reflect a growing attitude. Then you cited why this was hurtful in your statement, and that is that it reflected upon the whole operation of safety. Let me call your attention to something. Some time ago we had trouble with air collisions. The FAA invited pilots to report near misses. And so a lot of dumb country pilots like me—and I wasn't one of them who made the report—reported a near miss; and found himself cited because he was

at the wrong altitude or something, he was flying east at one altitude and he should have been at another. I noticed this magazine, the Pilot's magazine, published by AOPA, just said quit sending in the reports; don't report or you will get clobbered.

This is the kind of an attitude that doesn't contribute to air safety.

Mr. QUESADA. I agree with you.

Senator ENGLE. Of course it doesn't. But if the people in your enforcement organization take the attitude that they are snoopers and a sort of gestapo, sent aboard these airplanes and on every aircraft, trying to catch somebody like revenuers out in the country of my friend from Kentucky, it won't be long before you simply don't have any cooperation in the industry. I call this to your attention because I hear from these people. What they say to me isn't a very pleasant reflection upon the present attitudes in the FAA. Maybe you are not aware of this, but these people do not feel that the FAA, its enforcement people and its agencies, are undertaking to help them.

I don't know how that attitude arose. I don't know what you can do precisely to correct it except to take a good look to see that the FAA inspectors don't take that attitude.

I observed your statement. You speak from a very high pedestal in your statement. And it is enough to make some people bristle around this room to read this statement because it arrogates to you and to the FAA the only interest in the public interest.

Mr. QUESADA. I serve the public. I want to make that very clear.

Senator ENGLE. All the rest of them are self-seekers of special interest who will grind, twist, turn, and pressure in order to serve their ends regardless of air safety. I don't believe that is true. I think these airline pilots are just as interested in living, to go home and see their families, as you are. I think the average private pilot throughout the country isn't any more interested in getting himself killed than you are when drive down the highway in your automobile.

Mr. QUESADA. I have attempted to say that I hold the airline pilots as a group in the highest regard and highest respect. I have attempted to convey that there are a few, and a very small minority, that do not apparently live up to this high standard. I would like to make this thing clear, Senator: If you can cite—you say you have heard from many of these pilots, you have said here now—Senator Engle, if you can give me a specific example of a case where we have been abusive to a specific person, I will be more than happy to look into it and give you personally a report on it.

If you will cite me one example of one case where we have been abusive, I will be more than glad to do something about it, if it is justified.

Senator ENGLE. I can probably find one.

Mr. QUESADA. I will be glad to receive it.

Senator ENGLE. But I am not interested in that, because abuse, generally speaking, personal abuse—that sort of thing, is—is a personal matter.

Mr. QUESADA. It is not personal with me, sir.

Senator ENGLE. What I am concerned about is the attitude. What instructions have you given these fellows who are getting on these airplanes and in these cockpits? Are they instructed to "case the joint" and if they find a book out of place or something not quite

fitting to cite this pilot? In other words is it the attitude of an inspector as I said a kind of gestapo, moving in and out of this airplane to catch the slightest little infraction, however unimportant, in order to build up a kind of a head hunt and scout record for the FAA or not?

Mr. QUESADA. Sir, you have used the term gestapo as has one of these pressure groups to which I have referred. I would like to recite the procedure which in fact takes place when our personnel conduct a normal and routine inspection.

Mr. PUTNAM. From our instructions here:

It is of the utmost importance that the agent be thoroughly familiar with the air carrier's operations, specifications, manuals, aircraft operating limitations, route, and navigation and communications facilities. The agent will make arrangements to conduct an en route flight inspection by contacting the dispatch office sufficiently in advance to insure the least possible inconvenience to the air carrier. He will arrive at the airport in time to allow for all required observations prior to departure. A jump seat will be used whenever possible.

Do you want me to go down the list of duties?

Senator ENGLE. Don't read them all. If you will make them available for the record and let me have them——

Senator MORTON. They were read into the record this morning.

Senator ENGLE. Let's not be repetitious about it. I may be covering ground already covered.

Mr. QUESADA. With the consent of the chairman we would like to put this into the record as suggested by Senator Engle.

Senator THURMOND (presiding). Without objection, it will be placed in the record.

(Manual of procedure follows:)

The flight crew may then show the manifest, which contains a record of previous checks, to an agent subsequently approaching the particular trip for inspection purposes. It is not the intent to lower safety standards in any degree whatsoever, but merely to eliminate unnecessary duplication of checks. The entry on the flight manifest is merely for the information and consideration of agents concerned, and if a further check of the trip is considered necessary or desirable, the agent will conduct the additional check regardless of prior entries on the manifest and add a new entry in the appropriate place.

.32 AGENT DUTIES—EN ROUTE INSPECTION

The purpose of this section is to serve as a guide in the conduct of en route flight inspections and in the execution of Form ACA–608. This form will be used by agents in the inspection of both scheduled and irregular air carriers.

.320 PRIOR TO INSPECTION

It is of the utmost importance that the agent be thoroughly familiar with the air carrier's operations specifications, manuals, aircraft operating limitations, route, and navigation and communication facilities. The agent will make arrangements to conduct an en route flight inspection by contacting the dispatch office sufficiently in advance to insure the least possible inconvenience to the air carrier. He will arrive at the airport in time to allow for all required observations prior to departure. A jump seat will be used whenever possible.

.321 HANDLING OF FLIGHT CONTROLS OF AIR CARRIER AIRCRAFT

The following policy will govern all Aviation Safety Agents relative to the handling of flight controls of air carrier aircraft during an en route operation.

All agents are authorized to enter the cockpit of air carrier aircraft during en route flight for the purpose of performing their assigned duties. As a matter of courtesy, the captain of the flight frequently invites an agent to handle the flight controls of the aircraft regardless of whether the agent is assigned to Operations or Maintenance. In order to avoid possible criticism of the Office of Aviation Safety, should any irregularity or incident occur during the time an agent is handling the flight controls of an air carrier aircraft, only Aviation

Safety Agents, Flight Operations, will engage in the handling of flight controls. Even though it is recognized that certain maintenance agents possess pilot certificates or have had sufficient flight time to enable them to control aircraft in flight, it is believed to be in the best interest of the Civil Aeronautics Administration to adopt the above policy.

Agents will not operate the controls of air carrier aircraft during en route flight except by specific invitation of the pilot in command.

Agents will not handle the controls of an air carrier aircraft during take-off and landing when transporting passengers, goods, and mail, except when the pilot-in-command also occupies a seat at the flight controls and then only when the agent is fully qualified on the particular aircraft.

.322. PREPARATION OF FORM ACA–608

(*a*) The information called for in the boxes in the upper right-hand corner of the form is believed self-explanatory. The points between which the inspection was made shall be shown, not necessarily the published terminals of the trip. Station identifiers may be used. If the trip is boarded at a station where a dispatcher is not located, the name of the person authorized to sign the clearance will be inserted in the box labeled "By".

(*b*) Items 1–3 are believed self-explanatory.

(*c*) Item 4—*Instrument Approaches Made.*—Indicate the airports where the various types of approaches were made. Station identifiers may be used. Note on the back of the form any pertinent comments or recommendations regarding the approach procedures.

(*d*) Dispatch and Clearance: Preparation of Clearance and Flight Plan. Determine that the crew arrived at the dispatch office in ample time for study of weather notices and preparation of flight plan. Note particularly the selection of altitudes to be flown with respect to minimum en route altitudes, weather, winds, icing conditions, etc. and the alternates listed.

Compliance with Fuel Requirements.—Ascertain compliance with the provisions of the Civil Air Regulations governing amount of fuel required.

Adequacy of Weather Reports and Forecasts Attached to Clearance.—Ascertain what reports are available to the air carrier and what facilities are used to collect them. Determine the extent and accuracy of company forecasts.

Type of Clearance.—Check the appropriate type in each column.

Preparation of Load Manifest.—Note observance of gross weights and c.g. limits.

Compliance with Gross Weight and Runway Limitations.—Note observance of Civil Air Regulation covering take-off and landing distance limitations.

(*e*) Flight Crew Performance: Use of Check List—Observe whether proper use was made of the check list during all phases of the flight.

Pilot Technique.—Smoothness, accuracy and judgment are important items to be considered.

Cockpit Discipline and Procedures.—Crew members should demonstrate a clear-cut under-standing of their duties and complete cooperation in the execution thereof.

Acknowledgement of and Compliance with ATC Clearances.—The Agent will be alert to all clearances received and note compliance by the crew with respect to assigned altitudes, proper position reporting, holding, and departure procedures, and requests for changes in flight plans.

Radio Technique.—Note phraseology used by crew in contacts and general use and knowledge of radio equipment.

Compliance with Civil Air Regulations, Company Operations Manual, and Airplane Flight Manual.—Throughout the inspection, the agent will note, by crew actions and decisions, their knowledge of the above. If an emergency should arise, the procedures followed will be carefully observed.

Adherence to Authorized Route or ATC Clearance, Observance of Minimum En Route Altitudes.—These items are self-explanatory.

(*f*) Ground Crew Performance—Handling of Aircraft.—Observe the general handling and taxiing of aircraft by ground crewmen, including handling of passengers, loading procedures, and other ramp operations.

Refueling Procedures.—Note operation of fuel trucks, ladders and hose. Check for static line connection and smoking in adjacent areas.

(*g*) Functioning of Equipment: The airworthiness of the aircraft is primarily the responsibility of the maintenance agent, but the flight operations agent will nevertheless be alert to observe the general conditions of the aircraft.

Notify maintenance agents of any unsatisfactory items. Determine if airplane flight manual is aboard aircraft.

Instruments.—Note the proper functioning of all instruments and check for compliance with Civil Air Regulations governing required flight equipment.

Engines and Airborne Radio.—These items too are primarily the responsibility of maintenance agents but observations will be made and unsatisfactory items reported to the proper agent.

(*h*) Conditions of Facilities Utilized.

Airports:

Public Protection.—Note adequacy of buildings, ramps, fences, gates, signs, etc. for type of operation involved.

Lighting.—All lighting aids will be observed during landings and take-offs and while circling, attention being directed toward efficiency and operation of lights.

Ramps and Runways.—Observe surfaces of ramps and runways for deteriorated paving, sinking, etc. Check for undue cluttering of ramp with miscellaneous equipment.

Firefighting Equipment on Ramps.—Check for presence and condition of fire extinguishers on ramp.

Radio.—All facilities utilized during the trip will be checked for normal operation and adequacy of coverage.

(*i*) Agent's Comments and Recommendations: All unsatisfactory items and unusual incidents will be explained on the back of the form. Attach separate sheet, if additional space is needed. Pertinent comments and recommendations on any phase of the trip will be included.

.323 Crew Management and Cockpit Procedures

Agents assigned to an air carrier for inspection purposes should stress the importance of crew management in the cockpit. They should also request the carrier to incorporate in its training program standardized procedures to be used by all flight crew members, and proper crew coordination to be practiced by all crew members used in air carrier operations. En route inspections afford the agent an excellent opportunity for observing and evaluating crew management exercised by the pilot-in-command. With the implementation of larger and more complicated cockpits in aircraft used in air carrier operations, the necessity for closer crew management has become extremely important .

Agents when conducting en route inspections in air carrier operations, should pay particular attention to crew coordination, use of cockpit check lists, and cockpit procedures employed by different flight crews. Poor crew coordination and the use of different cockpit procedures by the flight crews reflect unfavorably on the air carrier's training program. Proper crew management and control would be even more important in the event of an emergency. If this does not exist under normal circumstances, it could not be obtained during an emegency.

The presence of good management in the cockpit has a direct relation to safety in air carrier operations. Therefore, emphasis should be placed on this factor in the agent's evaluation of an en route inspection.

.324 Cockpit Check List

Agents will ascertain that usable cockpit check lists based on the check list contained in the airplane flight manual, are prepared and made available for pilot use in each air carrier aircraft.

.4 Inspection of Flight Operations and Dispatch Offices

.40 General Responsibility

Proper supervision of the conduct and control of scheduled air carrier flights by both the flight and dispatch personnel is a primary responsibility of the air carrier's management. It is the responsibility of the Air Carrier Safety personnel in the regions to conduct continuing inspections to determine that the management is properly discharging its responsibilities.

In any instance where such flights are conducted otherwise than in compliance with the provisions of the applicable Civil Air Regulations, the air carrier's operating certificate, the operations specifications, or accepted good operating practice, these incidents will be immediately called to the attention of the responsible management personnel in writing with a request that proper remedial action be initiated. Where violations of the Civil Air Regulations,

or of the air carrier operating certificate or operations specifications are found, reports of alleged violations must be filed and processed through the proper channels.

.41 Inspection of Dispatch Offices

Each region will have an established program for the comprehensive and detailed inspection of each of the dispatch centers of the scheduled air carrier located within the respective regions. This program will provide for a thorough inspection of each of these dispatch centers when flight operations are being conducted under instrument weather conditions, and particularly when the weather at airports within the jurisdiction of the respective dispatch centers is at or near the specified weather minimums.

When the initial detailed inspections have been completed and appropriate action taken, a schedule of follow-up inspections will be established to insure that all of the scheduled air carriers are maintaining adequate systems of flight control and dispatch supervision.

Many dispatch centers are located in regions other than the one in which the headquarters of the air carrier is maintained. In the course of this program, complete coordination of the progress of such inspections, is necessary between the region conducting the inspection and the region in which the headquarters of the air carrier is located.

.42 Irregularities Resulting From Weather Interruptions

The purpose of this section is to provide a guide for agents in investigating irregularities of scheduled air carrier flight operations resulting from weather interruptions.

It is the responsibility of the agent assigned to the operations headquarters of the air carrier to review the records of these irregularities periodically, preferably each month, to determine if the air carrier used sound dispatching procedures and good judgment under the circumstances, and if the action taken was commensurate with safe operating practices. In the event these records are maintained at points other than the operating headquarters of the air carrier, the appropriate region will be requested to conduct the periodic inspections. Following review of the records, a report will be forwarded through regular channels to the region holding the operating certificate of the air carrier.

In order that the agent may intelligently evaluate flight interruption reports, he must be thoroughly familiar with pertinent Civil Air Regulations and current operations specifications of the air carrier. He must have complete knowledge of the company's boundaries of control, the availability of adequate meteorological service to forecast all weather conditions en route and be familiar with all forms used in dispatching the flight, as well as the manner in which the air carrier maintains records of weather interruptions.

If, after reviewing the records of the air carrier, the agent determines the flight interruptions to be of a routine nature involving no discrepancies or irregularities, he must so indicate in his report.

Should the investigation disclose an infraction of the Civil Air Regulations, operations specifications, good operating practices, or involve a condition bordering in any manner on a potential accident, the matter will be taken up with the responsible operations officials of the scheduled air carrier for corrective action; or a violation report compiled and forwarded through regular channels. The gravity of the incident will dictate the course of action.

.420 Check of Designated Weather Observers

Agents will refrain from instructing air carrier and airport personnel, designated as weather observes at Weather Bureau Cooperative Stations, concerning their weather reporting duties. Any necessary instructions concerning weather reporting by the above-named personel will emanate directly from the U. S. Weather Bureau. If any question exists regarding the adequacy of such weather data, such problems should be taken up directly with appropriate Weather Bureau personnel.

.43 Station Facility Inspections

Each region will have an established program for the comprehensive and detailed inspection of air carrier operations at all stations located within their respective region, at which air carrier operations are conducted. This program will provide for a thorough inspection of all of the phases of an air carrier's operations, which are conducted at these stations. Regions having certificate

responsibility for scheduled air carriers whose routes traverse other regions shall delegate authority to, or otherwise make arrangements with, those regions for the inspection of air carrier station facilities located therein. It is suggested that as many of these inspections as possible be conducted during periods when the air carriers are operating at or near their peak loads with respect to number of flights.

Form ACA–2107, Station Facility Inspection Check List Air Carrier Operations, shall be used in the conduct of such inspection to serve both as a record of the Class I check accomplished 11/22/49 at Teterboro Airport, Teterboro, New Jersey.

Agent's Signature – Title – Region

OR

Class II check accomplished 11/29/49 Teterboro, New Jersey to Kansas City, Missouri.

Agent's Signature – Title – Region

(*c*) The assigned agents and the air carrier management must periodically review progress on current improvement programs and plan new projects to be carried out.

(*d*) The emphasis must be put on improving the policies and systems under which company operations are conducted, rather than on mere spot correction or penalization of individual employees for acts for which the characteristics of the company system may be primarily responsible.

.31. Irregular Air Carriers and Commercial Operators

The basic practice outlined above for scheduled air carriers applies equally to en route inspections of irregular air carriers and commercial operators. The very nature of their operations will, of necessity, determine the frequency with which a particular operator is inspected. However, it is recommended that an en route inspection of each irregular air carrier or commercial operator using aircraft of 12,500 pounds or more maximum certificated takeoff weight be conducted at least once each 3 months.

The Washington office has received numerous complaints from large irregular air carriers relative to the frequency with which they have been subjected to spot/ramp checks and en route inspections, during any one continuous flight such as from coast to coast. Cases have been cited wherein during such a flight an aircraft was inspected as many as six times, although the load of the aircraft remained the same and the aircraft could reasonably be assumed to have remained airworthy during the trip. It is believed that in some cases these complaints have been justified, especially where too frequent inspections have resulted in a hardship to the operator through lost time, inconvenience to passengers, flight crews, etc.

In an effort to correct this situation, without lowering safety standards the following procedures are adopted:

Inspections of large irregular air carriers and commercial operators will be classified as follows:

Class I—Spot/Ramp Check, Operations

Class II—En Route Inspections

An agent, after conducting one of the above classified inspections, will obtain from the flight crew the flight manifest (required by CAR 42.62 and CAR 42.95) for the particular trip concerned. On the reverse side of the manifest, or if necessary on other available space of the manifest, the agent will enter the class of check accomplished, the date, and the place. Examples of such entries are as follows:

.2 Type Certification Boards

Proving flights of newly certificated air carrier aircraft have indicated the desirability of greater participation by Air Carrier Safety personnel in type certification of aircraft, particularly the accelerated service test portion thereof. Such participation would give personnel who might later be charged with the

responsibility of conducting proving flights on such aircraft, greater familiarity therewith and would tend to reduce differences of opinion as to the suitability of the particular aircraft for air carrier operations.

.3 En Route Inspection Policy

.30 Scheduled Air Carriers

It is the responsibility of each agent to whom certificate responsibility is assigned to conduct periodic en route inspections of the flight operations of that air carrier. These inspections will be accomplished with the degree of frequency determined by the agent based on the need for such inspections after taking into account all information relative to the level of safety of operations of the carrier. Experience has shown that there are many means and sources, other than standard inspections, for obtaining leads to matters which require attention, or which confirm an opinion that unsafe conditions or unsound practices exist, or threaten to become a fact in a carrier's operations. These would include, but not be limited to, discussions with company personnel and airman organizations; examination of company records; observation of training; observation of maintenance activities at company bases; information reports from district or field offices, certificated repair stations and CAA designees, etc. All of these means should be utilized to provide the means of determining the level of safety of the carrier involved.

In this manner, the manpower of the office can be mobilized readily and used flexibly for any situation requiring intensive and continued comprehensive examination. Offices and personnel shall undertake to achieve maximum effective use of the collaborative approach with responsible policy making and executive officials of the air carrier's management to secure safety corrections and system-wide improvements.

This approach has certain essential ingredients:

(a) The agent assigned to the air carrier must have accurate, relevent facts pertaining to company policies, practices, and operating conditions.

(b) The agent and the air carrier must consider that they have a joint responsibility in developing ways and means for effective corrections or improvements.

.180 Major Changes in Aircraft

The degree of testing required depends on the magnitude of the modification involved. However, the basic principles are the same as in the case of new aircraft and the assigned agents should obtain all data needed to determine whether the operation can be conducted safely.

.181 Type Aircraft Previously Approved for Air Carrier Service

In this case, the operational adaptability rather than the technical aspects of the aircraft should be emphasized together wtih the adequacy of the air carrier's training program. Operating data obtained by other air carriers using the same type aircraft should, whenever possible, be reviewed and compared with the applicant's proposed operation.

.19 Unsatisfactory Items

Unsatisfactory items noted by CAA personnel during a proving flight should be called to the air carrier's attention and every opportunity should be afforded the air carrier to correct the condition prior to the completion of the proving flights. Comments regarding unsafe items noted during the proving flight should be included in the final proving flight report together with a resumé of the steps taken or recommended to affect correction even though the item is corrected satisfactorily prior to the conclusion of the flight.

.191 Correction of Unsatisfactory Items

Before the assigned agent submits his proving flight report, he will forward to the air carrier a list of unsatisfactory items noted during the proving flight which must be corrected before final approval is recommended for the aircraft or the proposed operation. The air carrier shoudl, in turn, furnish the agent with a letter including the information that the unsatisfactory items have been corrected, or what action he intends to take toward a satisfactory correction. These letters, together with the agent's comments, become a part of the final proving flight report. It is desirable that final action be expedited in all instances.

The agent will conclude his report with specific and definite indications of approval or disapproval of the aircraft, new route or route extension for which the air carrier applied.

Senator ENGLE. What I am driving at is whether or not any type instruction is given to these people to make it clear that although they are there for the purpose of maintaining safety, they are there also in a cooperative spirit and trying, where they can be, to be helpful to these airline pilots and other personnel in achieving a good safety record.

It seems to me the attitude they come on the airplane with makes a difference.

Mr. QUESADA. It is in the basic instructions.

Senator ENGLE. If somebody reads a book and gets on the airplane and says "I am from the FAA and get out of the way"——

Mr. QUESADA. If you will cite a case, Senator, one case, I will be glad to look into it; if you will cite one case.

Senator ENGLE. I am not particularly interested in picking on individuals. The thing that concerns me is the general attitude developed among airline pilots generally toward the FAA, and the general attitude developed throughout the country among private fliers toward the FAA. They do not feel that this organization any more is a friend of theirs; that they have somebody sitting up there who is more interested in catching somebody on a small infraction than he is in doing the kind of basic job that needs to be done to improve air safety. That is a question of attitudes. It comes from the leadership down. It simply has to be put out from the top that you fellows are not enemies of the Air Line Pilots Association.

Mr. QUESADA. This attitude is of equal concern to us. I have attempted to recite this in my statement. I have attempted to describe that the agitation by some, a small group of people, is creating this impression for us. That is the real thrust of what I have attempted to say yesterday. I think the editorials such as you yourself just read are indications of it. This attitude is created and is the result of agitation performed by a few.

Senator ENGLE. There is no way to occupy a public office without having some criticism.

Mr. QUESADA. I welcome criticism. We have means for it. My door is open to anybody who wants to come in. If you can cite a case where I haven't been more than willing to see anybody who grants to see me—my staff is the same way—I would be glad to answer it, glad to.

Senator ENGLE. I have no doubt that that is true. What I am saying is that I think it is important that over the long haul that these so-called special interests who in my opinion have a very legitimate interest in this whole aviation field, be in a mood of cooperation with the FAA in its objectives, rather than the reverse.

Mr. QUESADA. We would hope so. I hope that these groups will see fit to enter into an attitude of cooperation with us. We seek it, want it, and need it. We need it very, very badly, and I hope that they will see their way clear to do so, as differentiated from agitating and creating public distrust and creating the very situation that you yourself fear and that I fear.

Senator ENGLE. Thank you very much, Mr. Chairman.

Senator MONRONEY (presiding). Do you have some questions, Senator?

Senator MORTON. I have a couple that won't take but a few minutes. Thank you.

First, I would like to make one observation on the comments of my good friend from California. I have been occasionally stopped by a speed cop. He might be the most polite man in the world but I never cared for him very much. And I think this regulatory thing is to an extent a policing agency, as are many of the regulatory agencies of government. I get letters from my constituents who don't like regulations of the ICC, of the FTC, of the SEC, and I know that it is a problem that the Administrator of the FAA is going to have to contend with, whether it be General Quesada or anyone else. And I think that it is important that we try to work out, especially with the pilots who are so deeply concerned with such an important factor in safety, the best cooperation we can.

I also admit the problem of establishing any rules or regulations without some criticism from those who are subjected to the rules and regulations. I think that that is clearly illustrated in our society generally.

I also agree that the Congress should retain as much as the lawmaking or rulemaking authority as it can, but in this complex society in which we find ourselves in the mid-20th century, we have had to delegate for many, many years to rulemaking bodies certain functions. It is not confined to aviation alone.

General Quesada, you, yesterday I believe, submitted a photograph of a rather complicated instrument, some instrumentation for control of a modern jet. I wonder if you would like to explain the significance of this in terms of cockpit discipline.

Mr. QUESADA. Sir, the modern jet airplane as all of us recognize is a very complex device in which thousands of things must work simultaneously. If any one fails in many instances the others are useless.

As far as cockpit discipline is concerned, the very image that I have given to the committee which shows a picture looking forward into a 707 cockpit, which is a myriad of instruments and devices and gadgets and levers and pullies and things like that, and switches, it is clear, crystal clear, that the human being is incapable of performing all the functions, relying on memory, that must be performed as you go through the various types of operations of this airplane.

As a result of this we have required, by the process of rulemaking, that the companies issue a checklist. It is not only important that the pilot and the rest of the crew—the whole crew—perform these functions, but also, sir, they must perform them in a proper sequence. And it is beyond—we should not expect a human being to be able to remember all of these things.

I will guarantee to you, and assure you, that nobody can. I can't. I cannot remember all the things that should be done. It is a physical impossibility for me to do so, as a result of practice. I can prove this. So we have developed this checklist which is a means of compensating for human frailty, that these things must be done in this order. It is a real disservice to the public when the crew does not do it in that order. It is well thought out, the companies have written the checklist, and so therefore we have seen fit to write a rule that not

only requires the companies to develop a checklist, but requires the personnel to conform to it. When they don't conform to it the frailties of human nature are such that the public is not well served.

I will get a checklist for one of these airplanes for you and submit it to you for your examination, with the consent of the chairman. I will get one. When you see this checklist if you think that anybody—I don't care who it is—could remember to do these things, I would be very, very much surprised. And this is one example of what we mean when we say cockpit discipline, to conform to an orderly procedure.

In this particular case one man even refused to use the checklist—didn't use the checklist, with the assertion that he doesn't use it when our inspector is not there, so why should he use it while he is.

I would like to draw to the attention of the committee again, on two occasions in 1959 aircraft landed with their wheels up, and the only conclusion that one can draw is that he did not conform to the checklist in this most elementary requirement of public safety.

Senator MORTON. Do you think, General, that in the field of general aviation—speaking of that now—that there is overregulation? I have had letters from some of my private pilots, plane owners in Kentucky, who indicate that since the establishment of the FAA that there has been established a degree of overregulation in this field. Would you care to comment on it?

Mr. QUESADA. I would say that there is not overregulation. As a matter of fact, of the new rules that we have promulgated, the first one I cited in my statement did not affect general aviation. The second one did not. The third one did.

Senator ENGLE. Which one is that?

Mr. QUESADA. The third one is one that is designed to improve and modernize medical standards for airman certification.

Senator ENGLE. Give me the page number of your statement.

Mr. QUESADA. Page 10, Senator Engle.

The fourth did not apply to general aviation. The fifth did. The sixth did not. The seventh did not. So two out of seven.

I think it might be appropriate, Senator, to bring out a point that is worth mentioning.

In 1959 there were in general aviation 326 pilots killed—fatalities. Other than pilots, or passengers, there were 348 killed. I would like to relate this to the number of personnel other than pilots killed by the air carriers. I have them by years here.

I will cite three categories of personnel. One, the pilots in general aviation, the number killed by year, other than pilot or passengers, and passengers killed by air carriers. The number of passengers in general aviation killed in 1958 is 348. The number killed by air carriers was 124. This is passengers. The number of pilots, general aviation, was 326.

Therefore we have a ratio of passengers in each case, 349 killed in general aviation, against 124 by the carriers.

Going to 1957, we have 363 passengers in general aviation killed, Senator Morton, against 67 killed by the carriers.

In 1956 there were 324 passengers killed in general aviation, versus 143 in the carrier operation.

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In 1955 there were 242 passengers killed in general aviation, versus 158 among the carriers.

In 1954 there were 316 killed, versus 16—316 passengers in general aviation versus 16 by the carriers.

I could go on, but the same ratio generally exists.

In this same period I would like to draw attention to the fact that in 1954 there were 10 people killed on the ground by general aviation; in 1955, 16; 1956, 5; 1957, 11; 1958, 4; and in the case of 4, they were killed in Senator Engle's State in Van Nuys when a pilot took off alone under circumstances that certainly can be questioned, and flew into an apartment house and for all practical purposes burned the apartment house down and killed four people in it, in addition to himself.

So this is the ratio of passengers being killed in general aviation versus the passengers being killed in carrier operation.

So I don't think that we are overregulating general aviation. Definitely not, Senator Morton.

Senator MORTON. This morning, in the discussion that you had with Senator Smathers, I wanted to break in but we got to the noon hour before I had an opportunity. He was making the point that decision has to be made in the operating department of an airline as to whether this plane will fly or not.

He brought up the fact that perhaps the temptation to fly with a full remunerative load would be pretty heavy on the traffic manager and it would be the traffic manager versus the maintenance man or whoever is the officer in the company to make the decision.

He also brought up the temptation on the part of the pilot to take a plane which he thought was all right but which might have a little something the matter with it, in his efforts to either get home for the weekend or because of pay considerations or something of that kind.

Don't you agree with me that in general, by an overwhelming majority, the integrity of the airline companies, and the integrity of the commercial pilots of this country, make that almost a hypothetical argument?

Mr. QUESADA. I go further, Senator Morton.

As I say I have been a pilot since 1924. I know a lot of these fellows and have lived with them. When I was flying the mail we were all together, and my association with them certainly in my present capacity establishes clearly in my mind that they are as a group outstanding.

They are conscientious, they are responsible, highly professional, and highly respected. And all of these adjectives they deserve, in my opinion. They are a very, very fine group.

My job basically is to weed out the few, to take care the few abuses that exist. And I am afraid to say that this occurs in every walk of life, and this is one of my major tasks. I hope beyond my ability to express, that this group, as a group, can see their way clear to give me aid to assist in a problem that all of us share. As individuals they do.

We have in the Agency a whole group, many advisory groups. These fellows serve an indispensable purpose to us. They give us assistance and aid that we would be in a hopeless position without.

I am terribly distressed that a hard core group has seen fit to spread this contempt and use invective to destroy, and I am going to do everything I can to overcome it. I hope that they will reform.

Senator MORTON. I merely wanted to bring this point up because I know that while Senator Smathers didn't mean to leave that impression, and doesn't, the record might be misinterpreted. It is my opinion, in my acquaintance, which isn't very intimate with many pilots, but I use the airlines a lot and get to know them, that they are just about the finest group of men that we have anywhere in this country.

I have been very favorably impressed with them and it is rather comforting to know that you are in their hands.

I have only one request, Mr. Chairman. There is an article in I think the current issue—I will send it down if permission is granted—in the Time magazine of January 18 issue, I believe, under "Aviation," which has some things to say about General Quesada. If permissible I would like to ask that it be made a part of the record.

Senator MONRONEY. That will be inserted at this point in the record.

(The article follows:)

AVIATION

DISINTEGRATION AND DISASTER

The 105 passengers with tickets on National Airlines 707 jet flight to Miami waited impatiently at New York's Idlewild Airport one night last week. Scheduled departure was 9:15 p.m., but the ground crew reported a cracked windshield on the Boeing 707, and National had to substitute two other planes—a turboprop Lockheed Electra and a conventional Douglas DC–6B. First come, first served, 76 passengers went aboard the Electra, and the plane roared off for Miami at 11:25, arrived safely about 3½ hours later. At 11:51 p.m., the remaining 29 passengers and a crew of 5 took off in the DC–6B. Less than 3 hours later they were dead.

As airline and Civil Aeronautics Board investigators pieced things together, the DC–6B had just started a 550-mile overwater leg between Wilmington, N.C. and Miami at the assigned altitude of 18,000 feet when the plane began to disintegrate. One body and chunks of fuselage washed in from the ocean; other bodies were scattered over 16 miles to the point where the forward section crashed in a plowed field near the hamlet of Bolivia, N.C., 15 miles inland. Pilot Dale Southard, 46, a World War II military Air Transport Service veteran, evidently had some warning of trouble, for some passengers were wearing lifejackets. But he made no emergency radio calls.

All signs indicated that he was heading back toward Wilmington, fighting desperately to hold his plane on course as it lost altitude and tore itself apart. Some experts guessed that the trouble could have been caused by a runaway propeller; others wondered about a midair explosion.

But not until all the pieces were reassembled, and all the fragements of bodies examined, were inspectors likely to make a knowledgeable guess about one of the strangest crashes in U.S. aviation history.

DEFIANCE AND DETERMINATION

The crash of National Airlines' Miami-bound DC–6B threw an eerie flash of light across one of the darkest problems of U.S. commercial aviation: the stubborn campaign by top brass of the Air Line Pilots' Association, AFL–CIO, against the efforts of the Federal Aviation Agency to enforce stricter pilot and airline compliance with U.S. air-safety regulations.

While experts were still collecting the North Carolina wreckage, the head of the National Airlines branch of the pilots' union, Capt. Robert J. Rohan, fired off a telegram to FAA Administrator, Elwood Quesada, suggesting a charge that made more responsible pilots' union members gasp.

The FAA's recently instituted pilot check procedure, Rohan implied, may have caused both the crash of National's DC–6B and the crash of a National-operated DC–7B (with 42 dead) last November over the Gulf of Mexico. FAA's

pilot-proficiency tests require pilots to go through "approaches to stalls and unusual maneuvers * * * even though * * * these maneuvers are not necessary, and are deleterious to the air frame, and may eventually lead to the failure," wrote Rohan. National's pilots, he added flatly, would refuse to take further FAA proficiency tests, "until this matter is resolved."

That matter was resolved quickly enough. As FAA's "Pete" Quesada quickly pointed out, "the maneuvers required in pilot-proficiency checks place less stress and strain on the aircraft than that frequently encountered in routine and regularly scheduled operations."

He was backed unanimously by airline officials. National Airlines' Vice President L. W. Dymond hurriedly said that the problem was a result of "local misunderstanding"; the pilots would indeed continue to take such tests—or else lose their licenses. Still, the telegram served to dramatize the pilots' union feud with General Quesada's administration, a feud based principally on the fact that in his 13 months as boss of civilian and military air operations, tough, dedicated Pete Quesada (Time, July 6) has cracked down mercilessly on slipshod maintenance and flying procedures that have bedeviled the airlines for years.

NO NONSENSE

Quesada, retired Air Force general officer, and at 55 still a first-class flying man, took over his new job at a time when air-traffic control in the United States was a dangerous hodgepodge of uncoordinated civil and military operation and when the onrushing jet age was threatening to make deadly confusion on the Nation's airways. He began by instituting a new program of cooperative military-civilian control of airspace, then set out to tighten civilian air-safety practices and bring them up to military standards.

He sent his inspectors through a demanding Air Force checkout course in the KC–135 (the military version of the Boeing 707), and took the course himself (he is qualified to fly all jet types including fighters). "Now," he says, "the FAA inspectors can fly these jets better than the man they're checking out." One out of four pilots, in fact, fails the FAA flight test on commercial jets first time around, and it was because the ratio was higher among pilots 55 and older that Quesada a few weeks ago made 60 the mandatory retirement age—and thus once more incurred the anger of most oldtime airline flyers, who had looked for retirement at 65.

In no-nonsense inspections of pilot qualification, flying and maintenance practices, the FAA has jumped on infractions, slapped heavy fines on offending pilots and lines. Last February, for example, a Delta Air Lines DC–6 dropped an improperly fastened cowling while in flight—the fourth such incident in 11 months. Fine, $1,000 (later reduced to $500). In June a National Airlines pilot, while observed in cockpit by an FAA inspector, failed to use his checklist in taking off and landing, explained to the inspector: "I don't use the checklist when you're not on board: why should I use it when you are?" Fine, $1,000.

NO DRINKS FOR DRUNKS

On the whole, many pilots and airline executives agree, with varying amounts of reluctance, that Pete Quesada's cleanup campaign is a good thing. Though many think that he is a stubborn hairsplitter in enforcing too many rules and regulations (e.g., forbidding pilots to fraternize with passengers during flight), most will admit that he has achieved more results than any of his predecessors—at a time when results are sorely needed. Last week, for example, Quesada issued a ruling (to the airlines' and air crews' gratification) that forbids passengers to drink liquor in flight unless it is served by a member of the crew—and not even then if the passenger appears drunk. More far reaching was Quesada's ruling that all U.S. air carriers must install functioning airborne weather radar in their passenger planes (exceptions: the aging C–46, DC–3). The order came after the FAA found that a Capitol Airplanes Viscount, which broke up in a thunderstorm south of Baltimore last spring killing 31 people, could have avoided the turbulent core of the storm if its radar had been operating properly.

Pete Quesada is determined to carry out such improvements and tightening of rules no matter how rough the fight. This week the fight will hit Congress, when Senator Mike Monroney's Senate Aviation Subcommittee opens hearings on the state of U.S. commercial aviation. The pilots-union reaction to the National DC–6 crash indicated that complaints will fall fast and furiously.

Quesada knows it, but he feels that he has got the public on his side. "When you go to the ticket counter and buy a ticket," says Pete Quesada, "you don't know who's going to fly you, or anything about his training, or the airline's equipment—nothing. The public acts in faith, faith in this system, and we'll see to backing up that faith. I'm here to represent the public, and dammit, the public will be protected."

Senator MONRONEY. By far the largest percentage of your employees are in the air traffic control branch, are they not?

Mr. QUESADA. That is true, Senator.

Senator MONRONEY. There are 2 or 3 times, or 10 times, perhaps as many as you have in any other branch?

Mr. QUESADA. About 50 percent of the Agency is in the Bureau of Air Traffic Management.

Senator MONRONEY. I would like to get a perspective on this and ask if in his communication—I will address this to Senator Engle and also to my colleague who has just left—has there been any criticism of the operations of the air traffic control system and the tower operators that have come to your attention?

Senator ENGLE. My problem is to fly my little Piper around and I can't even get to the tower, or anybody else. You read the flying magazines nowadays and they are advertising radios with 90 channels. Why in God's name should a private pilot in this country have to have a radio with 90 channels in it in order to communicate?

The last time I went into San Francisco—and these fellows generally do a pretty good job—I found out that they had changed their frequency. You read your map, you have your "Airman's Guide" with you, you take your library right along, and if you have a copilot you can read it. When you get all through and get on the frequency you find out that you are on the wrong one.

It is getting tough to fly an airplane. You have to have approach control, then the tower, then you have to get on the ground, then you get ground control. Maybe in major air terminals you can't avoid that. Before this discussion is over, I want to talk to you a little, General, about this business of dividing this traffic, because flying into Los Angeles, for instance, it takes two men in the cockpit to do the job and to be reasonably safe milling around through that wonderful California climate.

Senator MONRONEY. I thank the Senator for the commercial.

The point I was seeking to make—I do a good bit of private flying myself—is that I have never seen such a stepup in air courtesy as I have from the control tower operators. I really think as we look for places for criticism that we ought to find a few places to put flowers of praise. These men, these air traffic controllers, are rather dedicated. I don't see how they hold their patience, if you note the busy traffic and the amount of conversation that goes on at a busy control tower. Yet I have always found courteous, cheerful, and helpful men to give you your proper place in the landing pattern even though you may be flying a small, single-engine Democratic plane instead of a four-engine Republican plane.

Mr. QUESADA. Sir, may I have the privilege of extracting this from the record and sending it to them? I am terribly grateful that you recognize the difficulties of their job.

I will assume the responsibility of extracting this from the record and sending it to them. I am grateful for your comments.

Senator ENGLE. Wait until I get in my comments.

Senator MONRONEY. I have heard conversations and ins and outs with 20 planes over a busy airport, and these men still can maintain a cheerful attitude and a helpful one and try to expedite your flight or even go beyond that. I have had some extreme help at various times from men with something which it was not their duty to do, such as finding out whether the wheels appear to be in a down and locked position when the lights are out in the cockpit. They put their field glasses on to help you out there.

Senator ENGLE. Will the Senator yield?

Senator MONRONEY. Yes.

Senator ENGLE. I want to join in his comment. I flew throughout the State of California this fall, and dealt repeatedly with the communications people, the weather, the radio, and the traffic control people, and I found them uniformly courteous and endeavoring to do an excellent job. I know that they are not responsible for the fact that some of us fellows flying our beatup little flying machines have a hard time finding enough frequencies to get on. I do want to join in the statement made by our chairman and to say that I had sufficient interest in the matter within the past month to go out to Washington Center and to go through the entire setup out there with reference to radar surveillance and traffic control. I found it extremely illuminating and I was very much impressed with the competence indicated in this very busy center.

Mr. QUESADA. I would like to have permission to transmit your remarks to them, too, Senator. I would be very grateful.

Senator ENGLE. I would be delighted to have you do it.

Senator MONRONEY. General, we would like to try to finish up here.

You give, on page 10, I believe, a summary of rulemaking steps that you have taken. I wonder if you could sketch out briefly some of the other rulemaking activities in a general way. These deal more or less with the personnel of the plane and the flight crew, training programs, the qualification requirements of the copilots, improved medical standards, upper age limit of 60 or above, the skill and experience standards of commercial pilots, airborne radar, and reasonable limitation imposed on consumption of alcoholic beverages.

Could you give us a sample of some of the other rulemaking that you have undertaken during the past year, briefly? We don't want to deal with the technical side. I think it would be helpful for all of us to know what rule changes have been made.

Mr. QUESADA. We have taken rule action in the area of airspace that will dwarf this. I didn't mention it here, Mr. Chairman, because I understood you wanted to have a hearing on this in particular.

Senator MONRONEY. That is right.

Mr. QUESADA. I assure you it will dwarf this action. We have taken action in the area of air traffic management, and likewise in view of the fact that you wanted to hold hearings on air traffic management, in this area, we have saved this for that particular presentation. The rules that we have applied in air traffic management will also dwarf this, and we hope you will see that these rules have been helpful.

In the area of airworthiness, we didn't see fit to include them in here because there are just so many of them, airworthiness directives.

If I recall correctly, I signed four or five of them just yesterday alone. Many of these airworthiness directives are of small things; 111 have been issued this year, as an example.

Senator MONRONEY. These deal with such things as an accident occurring, a fire on board, in a wheel well or something, and you have directed a modification or change; is that the type?

Mr. QUESADA. That is correct.

Senator MONRONEY. Or de-icing equipment on carburetors, various things of that kind?

Mr. QUESADA. That type of thing.

Senator MONRONEY. In other words, as you get the information on the accident investigations from the CAB, and they make air safety recommendations, then in what percentage of the instances do you carry out these recommendations?

Mr. QUESADA. It goes much further than you have described. We have a system of receiving what we call an incident report. In other words, an event that occurred in which no accident is involved.

I would like to get some expert advice on this. When the 707 was first put into service, there was an instigation of a new procedure for incident reports. Will you describe this?

Mr. PUTNAM. The basic system that has been in effect for many years is called the basic mechanical reporting system. Any time there is mechanical difficulty that may endanger safety, it is reported to the local inspector on the same day. That report then comes in here by telegram. It is given a serial number and receives followup action. We use this to detect patterns in the service field, and we also share it with the operators. The Air Transport Association gets a copy of it, all the operators get a copy, and the information is distributed to everyone to take advantage of that information.

Senator MONRONEY. Did you have cognizance of the fact that these drum altimeters were sticking before the Electra crash in La Guardia?

Mr. PUTNAM. No, sir. Not until the accident occurred at La Guardia, and we investigated the aircraft log books, at which time we found there had been a few instances, I don't remember the number at the moment.

Senator MONRONEY. There were quite a few, as I recall CAB reports on that, where they had stuck a number of times.

Mr. PYLE. Mr. Chairman, there had been a few isolated instances of trouble, sticking with that altimeter, but it had not been sufficient enough to take any action at the time.

Mr. QUESADA. Nor is there any substantial evidence that the altimeter in this particular airplane in itself did stick and contribute to the accident.

Senator MONRONEY. But you do try to keep up, as these reports come in?

Mr. QUESADA. On a daily basis, Senator.

Mr. PUTNAM. Here is 1 year's reports.

Senator MONRONEY. What did you say?

Mr. PUTNAM. These are the daily mechanical reports, 1 year's tabulation.

Senator MONRONEY. You try to keep up with it on a daily basis, and these complaints or maladjustments or malfunctioning are tabulated.

Mr. QUESADA. It is done on a daily basis. Sometimes our action is to send a telegram to the operator, and he must perform certain functions the next time an airplane lands at a maintenance base. If the airplane is airborne, when it lands at a maintenance base he must perform certain functions then. And sometimes on a daily basis. The same thing happens throughout general aviation as well.

Senator MONRONEY. In conncetion with the air safety recommendations that are made by the Board as a result of these accidents that occur, even the nonfatal, do you have a checklist that you go through and see if proper attention is being given currently to their recommendations so that they will not be overlooked or ignored?

Mr. PUTNAM. Yes, sir. We have reveiwed the Board's exhibit and find we have taken action in all cases, with the possible exception of one which we have just got the past few days.

Senator MONRONEY. In connection with your investigation of accidents, has there been any case where you found any Government agencies or employees at fault? The Weather Bureau, for example, or your own Agency, or related agencies?

Mr. QUESADA. Sir, we take the same attitude toward our own personnel as we do other personnel. Even to the extent of imposing certain physical standards. We have imposed physical standards on our own personnel just as we have on others. There have been many cases which we will be glad to go into when we go into the air traffic management area, wherein one of our people engaged in the process of air traffic management has committed an error that has brought danger to public safety and we take action against him as we do against any others.

Senator MONRONEY. One of the things you take into account in a missed approach, for example, is whether the airway beacons are functioning properly and have not deviated.

Mr. QUESADA. We have a process where this is done with the least possible delay. As fast as we can get a flight check airplane to the location, we do it immediately. Plus our routine inspection of these facilities. We take the attitude that these facilities are a part of the whole aviation system and subject them to the same inspection as we subject the carriers.

Senator MONRONEY. The Weather Bureau, of course, is not your agency. That is related to it and you cooperate on the servicing of weather.

Mr. QUESADA. Definitely. We depend upon them to a tremendous degree.

Mr. PYLE. Our circuits are the main point or media for the distribution of all weather information. We are the communications agency for the Weather Bureau in the distribution of its information to the aviation community, both private and commercial.

Senator MONRONEY. Without criticism of the technical competence of the Weather Bureau, are you satisfied that they are properly manned, properly staffed, and have the proper number of full-time weather stations available to assist in the greatest degree of safety in air transportation, both commercial and private flying?

Mr. PYLE. Mr. Chairman, they are doing an excellent job with the facilities that they have at hand. They have problems, keeping up with the state of the art just as we do. These are matters that I be-

lieve you are going to be taking up with the Weather Bureau, and may well want to discuss with them.

Senator MONRONEY. Would you be prepared, if the appropriation should become available, for 24-hour weather reporting at stations which now report 8 or 12 hours of weather to the blackout of weather information in those particular areas, which is done because of lack of funds, to carry on the transmission of these data and disseminate that data so that private pilots can readily obtain it, and executive aircraft and airlines as well?

Mr. PYLE. To be sure I understand the question, this is the automatic dissemination of weather tapes?

Senator MONRONEY. You are working I know on weather tapes and on ways in which you can file and get current weather reporting every hour from certain telephone numbers that would give you the weather, and the weather conditions ahead.

Mr. PYLE. The answer is "Yes."

Senator MONRONEY. And your control towers, of course, broadcast the weather, but they have only such weather as is fed to them. The airlines have their own meteorological services and rely primarily on their own, rather than the Government's weather.

Mr. PYLE. This depends to an extent on the carrier. The larger, major, carriers have their own meteorological systems, or departments. Others do not. The local service carriers, for instance, in most instances, I think, depend primarily on the Government services.

Senator MONRONEY. In private flying do you not find in your investigation of accidents that weather is a causal factor in perhaps 70 or 80 percent of the accidents that happen?

Mr. PUTNAM. I think in the fatal acidents around 70 percent, yes, sir.

Senator MONRONEY. This is due to going into unknown conditions for which the pilot is perhaps not properly qualified on instrument conditions, or the plane is not capable of withstanding the turbulence.

Mr. QUESADA. This is the basis of our new rules which require that newly qualified commercial pilots will have enough training in instrument flight; to put it bluntly, just to save their life—to turn around and come out. And private pilots, I should say.

Senator MONRONEY. We will probably go into that at a later point. We are very interested in bringing up to the maximum necessary, for greater aviation safety, accurate reporting around the clock so that we will have a greater dissemination of weather information. You say that will contribute then to the saving of many, many lives in both general aviation and commercial?

Mr. QUESADA. It would contribute. It might be of interest, Senator, if I told you that the Weather Bureau, the Department of Defense, more specifically the Air Force, and ourselves, have engaged in a triangle program that is designed to bring into being a new type of quick reporting weather data. This is a research and development program in which we have the systems management, in which, however, the Air Force is an active participant, as is the Weather Bureau. It might be of interest to the committee at some time in the future to get thorough briefing on exactly what this program is. It is a very imaginative and constructive program.

Senator MONRONEY. It sounds very interesting, indeed. If you can put together the weather information as gathered by the Air Force and the Navy and the carriers weather stations and the Weather Bureau and others, then you would have a much more complete picture. At the present time you are blacked out of the military weather information, are you not?

Mr. QUESADA. The objective is to have a single weather system that is very rapid in its efforts, to make available to all the data that is current. And it is a triangle program. All of us are contributing and we hope to have some success from it.

Senator MONRONEY. While we are on that subject, also I might ask you: There has been use made now in a great many civilian fields of military radar, has there not?

Mr. PYLE. Yes, sir.

Senator MONRONEY. Have you got those figures? I asked for them this morning.

Mr. PYLE. I furnished them for the record, Mr. Chairman.

Senator MONRONEY. I think it will be interesting. This is the data we asked for this morning: short-range, terminal area radar——

Mr. PYLE. There are 54 military radar approach controls.

Senator MONRONEY. This is the FAA at the moment. Short-range terminal area radar sets the pilot upon the approach to the runway. Installed as of June 30, 1959, 48; and you have 54 military.

Mr. PYLE. That is correct.

Senator MONRONEY. Does that mean there are 54 military approach radar now being used as an aid to civilian fields?,

Mr. PYLE. That is correct; civilian and military.

Senator MONRONEY. Civilian and military. We have gone from 48 to 54?

Mr. PYLE. We have gone from 48—there are 48 purely civilian installations, FAA installations, and there are an additional 54 installations that are jointly used by—that are operated by us, either all or in part, and serve both civil and military traffic; and the 48 in addition serve both civil and military traffic. So we have a total of 102.

Senator MONRONEY. You have 81 short-range terminal radars programed for the fiscal year that will close June 30, 1960. Is that correct? These are the figures you gave me, 81.

Mr. PYLE. I think that is correct.

Senator MONRONEY. It says additional terminal radars installed since June 30, 1959, zero. Is that the lag in delivery?

Mr. PYLE. This is leadtime necessary to procure, to our specifications, the equipment. Those 81 are the total programed over the next several fiscal years, not just fiscal 1960.

Senator MONRONEY. A long-range program?

Mr. PYLE. That is the overall requirement as we see it.

Senator MONRONEY. Total to be installed by end of fiscal year 1962. This is rather slow delivery, is it not?

Mr. PYLE. It usually takes 18 months to 2 years from the time that we get your approval, or the approval of the Congress for the appropriation, to purchase this equipment, until we can get it installed. These are probably 1958 funds.

FEDERAL AVIATION AGENCY,
OFFICE OF THE ADMINISTRATOR,
Washington, D.C., April 6, 1960.

Hon. A. S. MIKE MONRONEY,
U.S. Senate,
Washington, D.C.

DEAR SENATOR MONRONEY: This letter, with its enclosure, is being submitted for insertion in the record of the current hearings before the Subcommittee on Aviation. The enclosure to this letter is a copy of a letter dated February 19, 1960, from the Office of the Secretary of Defense, concerning the availability of aviation equipment which might become surplus to military needs through the deactivation of military airbases.

This is responsive to your suggestion that such equipment might be helpful in advancing completion of this Agency's program for installation of airport facilities, specifically short range radar (p. 463 of the transcript, January 13, 1960). Although the letter from Secretary Taylor points out that it is the policy of the military services to return current and usable equipment to stock for reissue, we feel that the matter of the loan of this equipment could be explored further. To this end, we are instituting a series of meetings with the Department of Defense.

We sincerely hope that by April 30 we may be able to give you a more complete report.

Sincerely,

JAMES T. PYLE
(Acting for E. R. Quesada, Administrator).

OFFICE OF THE SECRETARY OF DEFENSE,
Washington, D.C., February 19, 1960.

Hon. E. R. QUESADA,
Administrator, Federal Aviation Agency,
Washington, D.C.

DEAR PETE: Please refer to your letter of January 28, 1960, concerning general policies the Department of Defense plans to pursue in the disposition of equipment available from military base deactivation.

Although no identification of specific equipment was made, I have assumed that the Senate Aviation Subcommittee was making reference to airfield equipment including electronic and ancillary equipment suitable for use by the Agency for air navigation and air traffic control purposes. With regard to this type of equipment, it is the policy of the military services to return current and usable equipment to stock for reissue. Obsolescent material which is declared surplus by a service is reported to the Armed Forces Supply Support Activity for screening first by the other military services, second to the General Services Administration for screening by other agencies of the Federal Government, including the Federal Aviation Agency, third, to eligible donees as authorized by law, before its final disposal by sale.

If further information is desired, please feel free to contact us for discussion.

Sincerely,

PHILIP B. TAYLOR,
Chairman, DOD–FAA Advisory Committee.

Senator MONRONEY. I have been reading about a lot of airbases being discontinued, one of which was in Oklahoma, unfortunately. I wondered if there would be a windfall that you could reach in and maybe speed this up a little bit by capturing some of these short-range terminal area radar for your own use.

Mr. QUESADA. We will certainly look into it, Senator.

Senator MONRONEY. It would seem to me it would be foolish for the military to hoard these in warehouses when they could be utilized on a loan basis until your own newer and probably better equipment comes in. It will help in the training of your short-range radar men.

The balance due for installation by the end of the year 1961, depending upon delivery of equipment, 31. So we will still be pretty short. We will have at the end of 1961, 54, which we have at present,

plus 2, 56, plus 31. If we could expedite that I think through some unused military equipment on loan it would certainly help a great deal.

Precision approach radar to help the pilot to come down on the slot, installed as of June 30, 1959, 10; FAA has money and has programed a total of 23. Additional precision approach radars installed since June 30, 1959, one. Balance due for installation by end of 1960, 12. So those seem to be coming through more rapidly. Is that correct?

Mr. PYLE. Yes, sir.

Senator MONRONEY. One other question: I noticed in connection with your statement at the top of page 32, you state that 65 complaints have been received against military airmen and were forwarded to the services for disciplinary or corrective action. Would you outline, (*a*) the provisions of these alleged violations; and (*b*) some few examples of what they are and the final action taken by the military in these cases if you do know.

Mr. QUESADA. I think we have that pretty well tabulated. We can give you an answer to this, Senator, in response to your question.

Mr. HOWARD. I might fill in some of the details on this. First, I think you asked what the nature of the violations is.

Senator MONRONEY. First, the provisions of the act under which you proceed against the military. This gives you the right to advise of violations of military airmen.

Mr. HOWARD. The provision of the Federal Aviation Act of 1958 that applies is section 1002. I will only read one portion that is pertinent:

> In the case of complaints against a member of the Armed Forces of the United States, acting in the performance of his official duties, the Administrator or the Board, as the case may be, shall refer the complaint to the Secretary of the Department concerned for action. The Secretary shall, within 90 days after receiving such a complaint, inform the Administrator or the Board of his disposition of the complaint, including a report as to any corrective or disciplinary actions taken.

Senator MONRONEY. Could you give us some idea of the nature of the complaints to which you have referred, these military violations?

Mr. HOWARD. The violations that the military most frequently engage in are obviously in the field of air-traffic control, because the other regulations we issue are not applicable to the military. These for the most part tend to fall into what you might call difficult cases to establish, such as near misses. They can be the failure to abide by an assigned altitude, or some such. In other words, infractions of the air traffic rules themselves.

I might say that we have forwarded 65 to the military during 1959, and we have received reports on a timely basis from the military, and that their disciplinary actions taken are, in the opinion of the enforcement experts of the Agency, extremely strict. I don't want to imply that they are too strict. I want to make it clear that we are satisfied that they are taking very, very firm enforcement action.

Senator MONRONEY. Would they be similar to civil action, excepting of a different nature, of a fine of $1,000 which wou might levy, to certain censorship or other things that the military might take?

Mr. HOWARD. I would say they tend to be more stringent than we take.

Senator MONRONEY. You are not having any difficulty in getting a report from the military on these cases?

Mr. HOWARD. None whatsoever.

Senator MONRONEY. That would go for Air Force, Navy, and Army?

Mr. HOWARD. This is true. I might, to give you some idea of the actions that they have taken, and the strictness of their action, say that in one case they have relieved a colonel of his command and required him to be fully retrained and qualified as a flier. They have grounded officers for life, permanently. This is on the extreme side, of course.

Senator ENGLE. That is the fellow flying under a bridge.

Mr. HOWARD. This ranges down the line to reprimand, which is a similar penalty to one we employ. We issue some reprimands, too. But I might point out that in the case of a reprimand in the military field this has a rather significant effect on his career and is really a much more stringent penalty for him than it would be for a comparable civilian violation.

Senator MONRONEY. I note in the summary you have 202 violation reports on military pilots, and you forwarded 65 to the services for disciplinary action; you closed out 47. Those closeouts were ones on which you didn't have evidence or enough of a case to submit to the military?

Mr. HOWARD. This is correct. And I might make another observation in that connection; namely, we do not always have a full investigation of this offense. Some of the facts may be in the possession of the military. Since it is their responsibility to go forward with the disciplinary action, we in effect take what we have, what material we have. If we see in it that there is a probable violation, we forward it to the military. So the mere fact that we forward a complaint to the military does not mean that we have established a violation necessarily. They then proceed to carry out any unfilled portions of the investigation and take whatever action they see fit.

Senator MONRONEY. The 90 such cases that you have on hand, would that be a matter of trying to verify the complaints?

Mr. HOWARD. This is true. It also is a matter of some embarrassment to me; namely, that we are not as current with enforcement cases—and this is in all enforcement cases, civil and military—as I would like to be.

Senator MONRONEY. What would alleviate that?

Mr. QUESADA. Less enforcement cases.

Mr. HOWARD. Less enforcement cases and perhaps more staff.

Senator MONRONEY. Have you had fewer or more instances of military violations than you had a year ago, or at the beginning when the act came into being?

Mr. HOWARD. I would say that there is no comparable statistic, really.

Senator MONRONEY. You had no jurisdiction whatever over military flying or even the right to report military violations at the time the act came on?

Mr. HOWARD. I may be correct, but I think the CAB did report certain facts. It was not a formal thing, however, and it was not statutorily required as it is today. I think they did report certain things.

Mr. PYLE. The real answer is that it has never been done properly until today. We did not have the proper mechanism nor did we carry any program out that was very effective in this area, for reasons which I think are quite familiar to you.

Senator MONRONEY. But today the military and civilian planes are flying according to the same set of traffic rules?

Mr. PYLE. Yes, sir.

Senator MONRONEY. And violations that are reported to the civilian go through the civilian side, and the others are looked at and then if deemed to be actual violations are submitted to the military for action and listed for discipline if necessary.

Mr. HOWARD. This is correct.

Mr. QUESADA. Looked at and investigated. We will go right on the military base and talk to the person right then and there.

Senator MONRONEY. You have that right?

Mr. QUESADA. Yes, sir. And they acknowledge this.

Senator MONRONEY. Do you feel from this statement that we are coming to the point where we will have a general flow of air traffic abiding by one set of air rules and not flying by two or three sets?

Mr. HOWARD. I believe this is so.

Mr. QUESADA. That is so, Senator.

Senator ENGLE. May I ask a question, if you are through?

Senator MONRONEY. I am not through, but I will appreciate your dwelling on it if it is in this direction.

Senator ENGLE. I want to talk a little bit about these restricted areas, for instance, in my State. You have been doing some work on that, have you not?

Mr. QUESADA. Yes, we have. We have made a thorough survey of the complex of restricted areas in southern California which is focused around Edwards Air Force Base.

Senator ENGLE. I hope you can straighten that out.

I also read in the AOPA pilots' magazine, which has been heretofore referred to, that you were making commendable progress in that direction. I observe also that out here at Andrews you have a climbout zone, and you have established those for jet aircraft off of these major bases. Why don't you also have an approach zone? Flying small airplanes, I am not afraid of what I am going to run into, I am afraid of what I am going to back into.

Mr. QUESADA. I have heard that phrase before, Senator. We would be glad to go into this in detail now if you wish. But I would suggest that we do so when Mr. Dave Thomas is here, who is the head of the Bureau of Air Traffic Management. We can go into it now, if you want.

Senator ENGLE. That is another subject and I will take that up then. What I am particularly interested in are two points.

First, I think these restricted areas ought to be cleaned up.

Secondly, with reference to the operation of certain types of aircraft, it seems to me that these zones you establish are very helpful. On Andrews we know where they are going out, but unless you

happen to know the traffic procedures—and I do—you don't know where they are coming in. It is very helpful to know on which side of a major base you take Castle. You referred earlier to training at Castle.

My problem in flying up and down California is which side of Castle to get on to keep out of the traffic pattern of those big jets. There is no climbout zone there.

Senator MONRONEY. I found on the jet fields that I have flown over that they have instituted very good safe paths and areas from clearly defined land markers, such as toll roads on the north, and perhaps another familiar marker on the south. And if you are above 3,000 feet from that marker to the field, you are out of the path of jet traffic.

It is very comforting to know that these big, fast planes are following an approach pattern that takes the commercial and the light planes out of the way of these high-performance aircraft.

Mr. QUESADA. Sir, I might comment and hope that I don't have to again until we get into the subject, and I hope my remarks won't be interpreted as the background of my military life. But I have to say, with all sincerity, that the military establishment has done more than I have ever expected them to do. They have undergone penalty to themselves, to their own interests, on occasion after occasion, to bring relief to a problem that all of us know exists. I think they haven't been at all happy with many of the things we have done, so they are one of our pressure groups, too. But I have to say in all sincerity, they have been more than cooperative and more than helpful to bring relief to this problem that has worried all of us. I couldn't ask for more.

Senator MONRONEY. I am glad to hear that report, because one of the motivating forces requiring correction was the conflicting traffic rules and the conflicting air traffic, both of which were operated from different sources, uncommunicative and unable to communicate with one another. The fact that we have had a year free of midair collisions with the increase in jets, I think, is highly illustrative of the fact that one mission has been certainly toward the goal that we sought. The others will perhaps require a greater amount of time.

One thing in closing I would ask: You are now monitoring all jet flights, are you not, above certain altitudes, with the use of early warning radar network?

Mr. PYLE. That is correct, Mr. Chairman.

Senator ENGLE. What altitude?

Mr. PYLE. Altitudes from 24,000 to 35,000, basically. This is a requirement.

Senator MONRONEY. This is done without any expense to the Federal Aviation Agency and as an extra dividend on equipment and personnel that the military was using for the warning system, is that correct?

Mr. PYLE. With one exception, Mr. Chairman. We do furnish the personnel, although the military personnel under certain conditions pitch in and help us somewhat, if someone is indisposed or something. They handle the assignment. Basically it is our controls, using the facilities, radar and communications systems, to accomplish the job. It is most effective.

Senator MONRONEY. So every jet flight today on schedule is monitored as it crosses the country?

Mr. QUESADA. With the exception of one little area out in the Rocky Mountain district—three little areas—where there is no radar coverage. It just doesn't exist. Then we go to separation.

Senator ENGLE. May I ask the Chairman to yield for one point?

Senator MONRONEY. Yes.

Senator ENGLE. You have put all air traffic over 24,000 feet under positive control, have you not?

Mr. PYLE. Senator Engle, let me explain it this way: The civil jet is restricted to certain specific routes, along which it must fly, in order that we can assure this separation in the Advisory Service of which we have been speaking. We have three positive control transcontinental airways from 17,000 to 22,000 feet.

Senator ENGLE. I want to ask you about that. Why did you leave that hiatus between 22,000 and 24,000? What happens up there?

Mr. PYLE. They are separate routes, Senator, and the important point, and perhaps we will get further into this in the air traffic management, the topic to be discussed there, among others, the basic point is that the 17,000 to 22,000 airways were set up to take care of piston aircraft which operate in this environment. The jet operates above it. It is a factor of its ability to operate, the efficiency of the engine at the proper altitude.

Senator ENGLE. You have 3 airways, 3 vector airways under that rule, 17,000 to 22,000.

Mr. PYLE. That is correct.

Senator ENGLE. And everything above 24,000.

Mr. PYLE. On the jet routes. They are numbered across the country. We can bring in an exhibit which will display them, both the East-West and the North-South routes.

Mr. QUESADA. We are prepared to show all of this to you when you go into the subject.

Senator MONRONEY. Thank you very much, General Quesada.

If there are no further questions we shall close. We appreciate your explaining these things and discussing them with us. You are excused until we reach the next part of the hearings, unless you have something further that you would like to comment on.

Mr. QUESADA. Thank you so much for your personal help, Senator. We are very grateful.

Senator MONRONEY. We will stand in recess until 10 o'clock tomorrow morning at which time we will hear Mr. Reichelderfer, the Chief of the Weather Bureau.

(Thereupon, at 4:48 p.m. the subcommittee was adjourned, to reconvene at 10 a.m., Thursday, January 14, 1960.)

REVIEW OF THE FEDERAL AVIATION ACT
(Air Safety)

THURSDAY, JANUARY 14, 1960

U. S. SENATE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
SUBCOMMITTEE ON AVIATION,
Washington, D.C.

The subcommittee was called to order at 10:08 a.m., in room 5110, New Senate Office Building, Hon. A. S. Mike Monroney presiding.

Senator MONRONEY. The Subcommittee on Aviation will resume its hearings on aviation safety.

We are honored today to have the Honorable Francis W. Reichelderfer, Chief of the Weather Bureau.

Mr. Reichelderfer, we appreciate your tolerance in the indefinite schedule we have been flying on. We have been subject to certain en route delays on various matters that we have been delving into.

We are glad to have you. We know we will have your interest in aviation in our investigation of air safety and a study of what more can be done. We need your advice and counsel.

Mr. Reichelderfer holds one of the very earliest Navy pilot's licenses. Or is it Coast Guard?

STATEMENT OF F. W. REICHELDERFER, CHIEF, U.S. WEATHER BUREAU; ACCOMPANIED BY MR. CRAIG, AVIATION BRANCH, U.S. WEATHER BUREAU; AND ERNEST NASH, GENERAL COUNSEL'S OFFICE, DEPARTMENT OF COMMERCE

Mr. REICHELDERFER. It is early compared to the numbers now. It is 2,422. This is a number that you always remember.

Senator MONRONEY. We are glad to have you. We know what you have been trying to do for aviation weather within the limits of the facilities and money available. We would like to have your statement. I presume you would prefer to complete the statement before being questioned?

Mr. REICHELDERFER. It is immaterial, Senator. If there are questions while I am speaking, I will try to answer them.

Senator MONRONEY. Thank you very much.

Mr. REICHELDERFER. I may have occasion, with your permission, to call on Mr. Craig, on my right, who is representing our Aviation Branch. Mr. Lorens, the Associate Chief of the Weather Services is on military duty and could not be here this morning. Mr. Ernest Nash, of the General Counsel's office, Department of Commerce, is with me also.

Mr. Chairman and members of the committee, the Federal Aviation Act of 1958 now under your review, includes a section on meteorological services specifying the authority under which the Weather Bureau under the Department of Commerce, provides weather reports, forecasts, warnings, and other essential meteorological information required by aviation.

This authority and its associated responsibilities given in section 803 are comprehensive. It charges the Weather Bureau with responsibility for weather observations, reports, and forecasts for aviation; weather support for the operations of the Federal Aviation Agency; cooperation with other meteorological agencies, at home and abroad; coordination of meteorological requirements in the United States, and promotion and development of meteorological science, and the fostering and support of research projects in meteorology through utilization of private and governmental research facilities.

The broad categories of causal factors of aircraft accidents, as used by the Civil Aeronautics Board, may be listed as:

1. Human—pilot and other personnel;
2. The aircraft, its powerplant, equipment, and accessories;
3. Weather; and
4. Airport terrain, meaning principally the condition of the landing area as the result of weather occurrences.

The Weather Bureau is concerned with aircraft accidents caused by weather and airport terrain from the standpoint of the adequacy of its reporting and forecasting services.

Bad weather conditions and particularly severe atmospheric disturbances cause many problems in aviation for which solutions have not yet been found. Zero-zero ceiling and visibility over a large region may completely tie up air transportation and so disrupt schedules and business or personal plans as to paralyze business operations for a time. Extreme conditions of turbulence in clear air, violent thunderstorms, jet streams with hurricane winds, and certain other conditions still are serious hazards.

Statistics indicate that there has been a gradual increase in aircraft accidents primarily due to weather, based on data for past 25 years. For example, in 1930, weather was the major cause of 6 percent of all aircraft accidents; in 1937, 8 percent; and in 1947, 10 percent.

The CAB has recently made a study of 815 air carrier accidents during the 10-year period, 1948 through 1957, and found that weather was a causal factor, although not necessarily a major cause, in 26 percent of these accidents. Further, the CAB has indicated the weather was a factor in 20 percent of all aircraft accidents in 1953, and 30 percent of all accidents in 1957.

I might add that this increase in accidents due to weather has occurred primarily in general aviation, and is due largely to the very great proportionate increase in general aviation.

In his statement before this committee at its opening session, the Chairman of the Civil Aeronautics Board, the Honorable James R. Durfee, stated as follows:

> Even on the basis of our preliminary work with 1959 data, it is apparent that the most important single factor encountered in general aviation accidents involved flight into adverse weather conditions with which the pilot was unable to cope. Approximately 40 percent of the total number of fatalities in general

aviation can be attributed to this factor. In recognition of this problem, the Federal Aviation Agency has initiated regulatory action designed to correct this deficiency by requiring a minimum familiarity with instruments for all pilots.

So far my remarks have referred primarily to aviation. But bad weather conditions have great impact on other human activities—agriculture, highway traffic, business, engineering, industry, shipping, and a large variety of business products and services, social events, and so on. The Weather Bureau's job is not only to observe and report these unfavorable and at time hazardous weather conditions, but also to forecast them and to warn pilots and the public in advance or as soon as possible after the conditions are discovered, and describe the hazardous conditions and the areas in their paths. The severity of the hazard is important in aviation because aircraft have different capabilities, strengths, and equipment, and some pilots may wish to fly through the area while others will wish to avoid it because of its severity for the particular aircraft they are flying.

There are many significant weather elements to be reported and forecast. As you will note in the box in the upper left of the chart entitled "Weather Factors in Aviation Safety," these elements refer to weather conditions both at the surface—mainly at airports—and in the upper air. I will not read through all of those factors. They are those with which most of you who are familiar with aviation are familiar—barometer, temperature, weather, winds, and so on.

Among other uses of barometric pressure in air navigation these data over a large area provide maps of the pressure fields for determining how high and low pressure areas are developing and moving. Because of the need for forecasts 12 to 48 hours in advance for aviation purposes, this information must be obtained from around the entire Northern Hemisphere so storms and fair weather areas can be tracked from their inception through their periods of strength to their weakening and dissolution. For this purpose, there is a worldwide network of communications, and an international interchange of weather intelligence, operated in cooperation with the weather services of other countries. This network serves all uses—aviation, agriculutre, shipping—maritime, rail and truck, hurricane warning, and general public forecasts.

Other significant elements in the list on the chart are related directly to the needs of aviation. They include the altimeter setting which is used as the basis for separation of aircraft; the temperature and dewpoint, which serve both as forecasting tools and as elements by which to gage the powerplant performance of aircraft taking off; and humidity, which has its uses in connection with the comfort of passengers awaiting in aircraft on ramps. The humidity has other uses in aviation, also.

This list also includes the direction, speed, and gustiness of the surface wind which plays a large part in various aeronautical problems, including orientation of runways, the selection of runway for landing or takeoff, the takeoff and approach techniques of the pilots, et cetera. Other significant weather elements listed under "Surface" include such conditions as fog, haze, smoke, sandstorm, duststorm, blowing snow, rain, snow, hail, sleet, freezing rain, snow depth, icy conditions of the landing areas, the surface visibility, and runway visual range. The visibility, of course, is a critical factor in the flow of traffic into

and out of airports as well as being critical with respect to safe operation.

Significant weather elements in the upper air taken separately or in combination have an important effect on aviation safety. These are listed in the right-hand section of the chart in the upper left. They include upper wind conditions—and in order to satisfy all civil users of the airspace, wind reports for all levels up to 50,000 feet are needed for operational purposes and up to 100,000 feet for analysis and forecasting. This is because the conditions at the higher altitudes have a bearing on the genesis, the generation of storms and jetstreams at the lower levels.

Then, too, reports and forecasts of turbulence in clouds and in clear air, to the best of our ability to detect and report them, are necessary. Jetstreams in the upper air must be located and described as to their direction and speed of flow, their thickness, width, and associated turbulence. About 10 days ago, several aircraft set new West-to-East records from California points to cities on the east coast. The jetstream helped and of course its unusual velocities eastward necessitated careful selection of other flight routes for westbound aircraft on the same day.

It is obviously very important to delineate the boundaries, vertical and horizontal, and the direction and strength of the jetstream for navigation purposes.

The amount, kind, heights, and thickness of clouds is significant weather information, since the presence or absence of clouds determines the permissibility of visual flight rules operations or the need for air traffic control separation under instrument flight rules. The ceiling, which normally is the information on the altitude of the base of the lower clouds, is the critical factor in availability for use of airports, the instrument approach procedures applying at any given time, and the safety of landings and takeoffs. Other significant weather conditions in the upper air for which there must be constant surveillance, include icing conditions, fronts, line squalls, severe local storms, thunderstorms with their hail and lightning, tornadoes and hurricanes which have a far-reaching effect on the general public and are also of great concern to aviation because of the need to reroute aircraft, redeploy parked and hangared aircraft to fields out of the path of the hurricane, and to protect hangars, other structures, equipment, employees, and passengers from the effects of these destructive storms.

And I don't know, Mr. Chairman, whether you have heard of the report in Oklahoma City at 5 o'clock this morning or not.

Senator MONRONEY. Yes, sir.

Mr. REICHELDERFER. We have a report on it. It wasn't too serious. It was another indication of what goes on aloft in the variety of conditions that we encounter.

There are several criteria used in the weather watch to determine when changes in the conditions of the weather and of its various elements are of sufficient aviation importance to require the filing of a special report, a forecast amendment or a flash advisory message for aircraft in flight. The weather watch for aviation is expected to provide an all-inclusive service for safety and efficiency of all aviation—civil and military. Special reports or forecast amendments have to be

issued whenever there is a beginning or ending of hail, freezing rain, sleet, duststorm, sandstorm, thunderstorm or tornado; also whenever there are reported or expected such occurrences as surface wind shifts, doubling of surface wind speed to 26 knots or more, decreases or increases in ceiling or visibility values, the former whenever the change passes through any of 10 selected values and the latter—visibility—through any of 7 selected values. In the upper air, reports or amended forecasts are called for whenever there are changes not previously forecast in wind direction of 30 degrees or more, windspeed changes of 20 knots or more, and changes in upper air temperature of 5° C. or more. The requirement also applies to new developments of severe or extreme turbulence, moderate to heavy icing, and changes in the location and movement of hurricanes.

Flight advisories are messages containing information pertinent to the safety of aviation which would otherwise be unknown to the pilot because of new conditions which developed after his takeoff. They are prepared by the Weather Bureau and are transmitted ground-to-air by FAA communications stations. They relate to tornadoes, thunderstorms, hail, duststorms, moderate to heavy icing, severe to extreme turbulence and to the initial onset of extensive areas of low ceilings and/or restricted visibilities.

Because weather moves and meteorological conditions over the oceans and in other countries affect weather in the United States, we must collect weather information from all over the hemisphere. Worldwide reports are channeled to the National Meteorological Center at Suitland, Md. This extensive communications system illustrated in chart II is a fine example of the cooperation of the world's meteorological services and of aviation communications authorities such as the FAA. Agreements on hours of synoptic observations, standard methods of observation, coding of weather for rapid and economical transmission, and issuance and distribution of aviation, marine and other forecasts are some of the corollary efforts which have brought us to the point today of being able to chart, analyze and forecast the weather over the Northern Hemisphere, both at the surface and at upper levels. The analyses and prognostic charts processed by computer methods at the National Meteorological Center at Suitland are distributed by facsimile circuits—see chart III—to forecast offices of the Weather Bureau and to industry offices which have drops on the circuit at their own expense.

These facsimile charts go to all users of weather maps for daily forecasting. The Air Force system is integrated with this system. The Navy uses them. So they serve as a common National Meteorological Service facility.

Special facsimile circuits—green lines on chart III—connect the high-altitude forecast centers established recently to meet the needs of high-level jet transport flights, both transoceanic and transcontinental.

To complete briefly the story of communications for the weather service, we need mention only the various teletypewriter circuits which carry hourly and special weather observations, synoptic observations, forecasts and upper wind information, and the detailed reports from overseas to hundreds of weather offices, FAA facilities, airline con-

nections and military weather service stations all over the United States.

Another dissemination medium, this time from ground-to-air for the direct use of pilots in flight is continuous aviation weather broadcast service. As many here will recall, it was originally intended that the old four-course radio ranges would be decommissioned when the VORTAC system of navigational aids came into being. However, there proved to be a very urgent need to continue the radio ranges as a channel for weather information, particularly for general aviation, much of which operates from airports not provided with connections to the weather teletypewriter circuits. Flying farmers, crop dusters, and others also needed this coverage.

I won't attempt to name them all—executive flyers and all of those in general aviation need this coverage. Accordingly, 88 radio ranges are now being converted to weather broadcast facilities, and the 11 now in operation—see chart IV, "Aviation Weather Broadcast Stations"—have received enthusiastic acceptance by the operators of executive and private aircraft. Conversion of the remaining 77 facilities is being speeded by the FAA, and the Weather Bureau is developing the necessary staff to prepare the weather information for the automatic broadcasts. Each facility broadcasts pertinent reports and forecasts for the approximate area of the circle around it on the chart. This is a most important air safety facility and I will say more about it later.

Next, I would like to describe the modernization plan for the aviation weather services and to indicate what the Weather Bureau is doing and what we plan to do to solve weather problems involving safety in aviation.

Since 1955, the Weather Bureau has restored some of the weather services that had been curtailed in earlier years and has increased its research and development of modern meteorological equipment. Included in the new equipment for airports have been rotating beam ceilometers, for automatic and continuous measurement of cloud ceiling height; transmissometers, for electronic measurement of visibility, and suitable for provision of the value of runway visual range after recalibration; and automatic equipment, for location within the runway complex, to measure wind direction and speed, temperature, and dewpoint. This equipment is remoted, so that the measurements will be available continuously at the Weather Bureau airport station or in the FAA tower.

Other improvements in equipment include high-powered radar, the best weather radar in the world. These, together with radar meteorologist personnel, are being deployed to the best effect to provide coverage over areas that have thin ground observation coverage, in order that they may supplement and intensify our detection of hazardous weather aloft.

Another recent improvement is the high altitude forecast service. This was started in February 1959 to serve turbine-powered aircraft operations over the United States and the oceans. Forecasts are issued four times daily by seven high altitude forecast centers located at Idlewild, Washington, Miami, San Francisco, Anchorage, Honolulu, and San Juan. The first four centers named exchange and distribute forecasts for the levels between 20,000 and 40,000 feet by means

of the special facsimile circuit discussed previously—shown by the green lines on the chart—and this circuit is also connected to 14 other airports used by jet aircraft. Work is progressing on radio-facsimile connections to Anchorage, Honolulu, and San Juan. Meanwhile, exchange with those points is accomplished by encoding the information, as distinguished from facsimile transmission, which is much better.

Semiautomatic, closed circuit television briefing systems were installed at New York and Miami late in 1959, and additional installations are planned at San Juan, Chicago, and San Francisco early in 1960. These TV briefing systems will program a series of charts for areas covering long-range and high-altitude flight operations before the TV viewers, who will be pilots in operations offices, and the charts will be accompanied by an oral discussion by the forecaster of the significant features of the charts and their bearing on flight operations.

This closed circuit TV method has been under trial for some years. The Air Force has used it, and others have used it. We believe that it is a method that will be used very much more broadly in the future.

As I mentioned previously, work is progressing rapidly to bring to full operation the 88 low-frequency radio range transmissions of weather information. Besides reports and forecasts for the area of local concern, each station will include an up-to-date description of the general weather situation and its expected development within the area. The tapes for these broadcasts will be kept up to date by substitution of new tapes whenever new text is provided by the Weather Bureau. We expect other very valuable developments in this "omni-flying-weather beacon."

In the research field, as included in the President's budget this year, the Weather Bureau is planning to participate with the FAA and the Air Force in a long-term program, intended to completely modernize and largely automatize aviation weather observing, communication of weather reports, weather data processing and forecasting, and dissemination of reports and forecasts on a complete systems basis. This facility, known as project 4338, will be related to improvements in the common system of air traffic control and navigation. The Bureau will continue research toward improvement of weather measuring components of the system, especially in airport terminal weather forecasting, with the aim of devising systematic forecasting methods for high-speed computer use, applicable to all major jet airports.

Other improvements planned for fiscal year 1961 include doubling the scan speed of the national weather facsimile circuit, and addition of observing staff at jet terminals; also staffing to cover weather watch at points where FAA personnel are being withdrawn in the program of centralizing FAA communications stations. In the upper air, improvements will include increase in frequency of upper-air soundings to 4 per day at a network of 35 of the 96 land-based stations in the United States, use of more accurate devices for measuring high-altitude pressures, use of balloons capable of reaching 100,000 feet; and establishment of 2 new upper air sounding stations to fill gaps in the network. Radar coverage will also be expanded. Another very important program provides for development of the system for recording and rapid dissemination of pilot weather reports.

As regards other items of equipment, plans for improvement and expansion include additional facilities and personnel for upper-air

soundings on merchant vessels; additional end-of-runway equipment for airports equipped with instrument landing systems; temperature and humidity recorders for observations within the runway complex, and self-help weather briefing displays.

All of these improvements are part of the 5-year plan for bringing the aviation weather service up to requirements for aviation safety. Further improvements, under the plan, would provide more rapid and up-to-date weather reports, by automation of observations and more automatic transmission of weather reports. The plan also envisages refinement and wide-scale use of automatic weather stations, that is, to observe and automatically transmit the basic weather information.

Senator MONRONEY. Is that observation automatic or are you referring to the transmission?

Mr. REICHELDERFER. The whole thing. To do away with the personal observer insofar as is possible. We have equipment already in operation, and we have had for some years, for all of the common elements, except cloud forms and clouded amounts and visibility, and such things as sleet and other factors that are difficult to detect by instruments so far. We are working on equipment to make the whole thing automatic, because this would mean that we would install automatic stations at the intermediate airports, the less frequented airports, and thus have complete coverage, whereas there are large gaps in the information now.

The plan also envisages refinement and wide-scale use of automatic weather stations. After considerable development work, which should make possible the use of devices for sensing weather elements that must now obe observed by eye or measured manually, for example, cloud amounts, sleet, et cetera, the plan also calls for research to develop techniques for more accurate forecasting of en route weather, including studies on the prediction of upper level winds, investigations of jet streams, temperature distribution, clear air turbulence, aircraft icing, and vertical drafts. Electronic computers will be developed for forecasting. The procedures will be compatible with the high-speed observing and communications network.

One of the problems is to have these new developments fit in with what we are doing now so that we won't have to scrap the basic systems we have now.

The plan also calls for recruitment and training of aviation weather forecasters, briefers, and technicians who will be needed to provide the expanded service and to install and maintain the automatic electric equipment.

Chart V, entitled "Modernization Projects," shows, in outline, the projects within the scope of the modernization plan. Among the 44 projects listed, the weather information dissemination projects in block C of the chart are especially pertinent to this testimony. Those projects illustrate the various means by which weather information, after it is gathered and processed, is to be distributed for use of pilots. I have already mentioned weather broadcasts over radio range stations. That very important channel of dissemination of aviation weather reports is well along. It is a cooperative program of the Federal Aviation Agency and the Weather Bureau. We prepare the weather reports and forecasts and the FAA puts them on the air.

Project C–2, weather information via telephone answering systems, is intended to provide a means whereby pilots can dial a number and receive, on the ground, much the same material that is broadcast for pilots in flight under Project C–1, the radio range project. The serious congestion in telephone inquiries for flight planning purposes during periods of bad weather—which is the time when they are most important—when the weather stations and staff are fully occupied—these new channels, we hope, will take care of most of the dissatisfaction with these services. Project C–3 represents another possible method which would couple the calls to the broadcast mechanism and enable pilots to listen over the telephone to what is being broadcast by radio; that is, telephone dialing into weather broadcasts.

The next item, Project C–4, has also been mentioned previously. Closed circuit television briefing is a device which permits pilots at large airports, where ground travel time between buildings if prohibitive, to remain in their operations office and receive the latest charts and the advice of the weather briefer by TV.

Project C–5, visal representation of flying weather conditions, involves the use of speeded-up facsimile circuits to provide weather stations with new type pictorial charts of current weather and its expected development ready for immediate display to pilots. I am sure it is apparent to all who fly, but perhaps it is worth emphasizing, that there are such variations in weather, and selection of words and understanding of words in some cases means different things to different people, that a picture in weather is indeed worth a thousand words. And the more we can picture these things, the more faithfully we will convey the information from the weather office to the mind of the pilot.

Senator MONRONEY. May I ask—I don't mean to interrupt—these facsimile weather pictures would cover the whole United States, or would they cover a local area, or how large an area would it cover?

Mr. REICHELDERFER. It would vary. For some briefing purposes it would cover a relatively small region. Usually it would cover a large segment of the United States.

Senator MONRONEY. Of course, that is probably done by the airlines on their own in their meteorological services and their compilation of information which you supply. Local weather, perhaps statewide, would be more detailed, would it not, for local flights, and for general aviation?

Mr. REICHELDERFER. Yes; this is true.

Senator MONRONEY. How current would you be able to keep that? Would it be hourly?

Mr. REICHELDERFER. It ought to be right up to the minute. As soon as changes in the reports come in, the chart ought to be revised. This is the aim.

Senator MONRONEY. But it is so automated that it would be no great problem to keep it current?

Mr. REICHELDERFER. No. And the scale of the chart may—the scale shown may very well be changed from time to time because if the weather is generally fair, a chart for the entire United States could very easily be shown. If there is a lot going on, if it is very bad, a very bad weather day, then the detail is so great that it would be necessary to reduce the scale of the chart.

The self-help weather briefing displays are another aspect of the plans to provide fast service to pilots who visit the weather stations. We are working on a display which will be standard, so that pilots, after becoming familiar with it, will find the same arrangement of information at each weather station.

Senator ENGLE. Would you yield for a question there?

Mr. REICHELDERFER. Certainly.

Senator ENGLE. Could you tell me why the upper wind reports are written in a code that the average pilot can't understand after he reads through all the books on it? I can understand your upper wind forecast, because you will have the altitude, you will have a 7 dash 19. That is 190, and what follows is the wind in knots. But when you get into upper wind reports I observe that they are all coded and you get a string of figures put together. How in the world any poor country pilot is going to figure that out, I don't know. We ought not to have to be experts in order to read these reports. Is there any reason or justification for that?

Why can't the upper wind reports be as simple as the upper wind forecasts?

Mr. REICHELDERFER. This is a problem, Senator. We have had a number of comments, such as yours. It is coded of course for transmission in order to get it within the teletype circuit cables. That is, there is so much weather that our present circuit capacity is exceeded many times, and many of the important reports don't get on.

So much for the transmission. If we have two or three times the capacity of circuits, transmission circuits, then we can transmit it in clear language. This may not be necessary.

Senator ENGLE. I am aware of that. I would rather have less reports and be able to read them, and know what they mean, and to get some value out of them. I can read the upper wind forecast, and they are fairly simple.

Why can't the upper wind reports be done the same way instead of coded?

Mr. REICHELDERFER. We don't include in these reports anything that is not significant or different. If we cut out the reports then we would have worse complaints in the failure to describe the variety of conditions.

The solution to your problem would be for us to decode them in our displays so that when you go into the office and want to see what the winds are, you could read it in plain language. This is purely a matter of staffing.

It takes a lot of time to decode all of these reports and get them on the board. We realize it is important. But the staffs just don't have time to do it.

Senator ENGLE. I will be frank to tell you that your upper wind reports are useless as far as the average pilot is concerned.

I have looked over the display out at the National Airport. You are doing a fine job in trying to make those uniform. But we have one set of hieroglyphics, we learn, and that is in connection with your hourly sequence reports. They are fairly simple and a fellow with a little attention can get those. But this coded winds aloft report is something that seems to me ought to have a change, as to its utility. If it hasn't utility, what is the use of putting it out there. They say to

us that you can talk to your weather people and your weather people incidentally are very cooperative and give all the time they can. But I have been out there at the National Airport when that fellow couldn't get off the phone, and I have been down here trying to get him when I couldn't get him on the phone because his phone was always busy.

So they have their hands full.

Senator COTTON. Will the Senator yield?

Senator ENGLE. Yes.

Senator COTTON. It isn't quite clear to me when the Senator in his questions, when he says the average pilot can't understand these codes, whether he is speaking about airline pilots or private pilots.

Senator ENGLE. The airline pilot will get his weather briefing and his information directly. In other words he sits down with his people, they often give him a weather map of his weather enroute, so that he has it fairly explicity. I am speaking about the general aviation pilot. You heard General Quesada say here the other day that we had a lot of people getting killed because these private flyers run into weather. They don't know how to stay out of it. Sometimes they don't know how to turn around when they get into it.

What I am talking about is the reports that the general aviator uses, and the wind aloft reports are in code.

Senator COTTON. Do private pilots get into the upper regions, the high altitudes?

Senator ENGLE. No, but a lot of these airplanes we fly now we will fly at 10,000 to 15,000 feet without any trouble. We don't.

Senator COTTON. This high altitude you refer to is upper winds?

Senator ENGLE. Yes. The winds aloft report would cover everything all the way up.

Mr. REICHELDERFER. Senator, the term "upper winds" or "winds aloft" is used loosely and generally to mean anything above the surfaces, the ground wind, so it would take anything from 100 to 200 feet right on up to the top of the atmosphere.

I should have said, it slipped my mind, that most of our offices have the upper winds decoded and plotted by arrows and figures on charts. Those should serve your purpose in most cases, Senator Engle. I don't know whether they have been brought to your attention or not. Those should be available for all pilots.

Senator ENGLE. I have been looking through the material put out of the business of interpreting these winds aloft reports, as distinguished from the winds aloft forecasts. I couldn't understand why there is such a complex code.

Mr. REICHELDERFER. We will look into that and see if we can get some further information on it.

Project C–7 relates to the need for an internal weather service facility to make the best possible use of the radar network, while Project C–8 would provide a system for video display of radar network scope information in forecast and briefing offices. This is advanced equipment. Radar has only come into common use for weather purposes during the last few years, and the radars that the Bureau is installing now, as I referred to previously, are the very latest. I think we can very safely say they are the best in the world for weather purposes.

The best picture you get is to watch the radarscope. It is better than a thousand words. What we would like to do in the briefing is to get this information in some form so that the pilot can also see it.

Pilots checking weather for their flights could actually see the condition of the weather in various areas as the several scopes in the network are scanned, and of course forecasters and weather briefers would have a much more up-to-the-minute and comprehensive knowledge of current upper air conditions in their areas.

I shall not take the time to go into detail on the remainder of the list of projects but shall be glad to attempt to answer any questions. I would like to focus attention on two more matters—pilot inflight weather reports and cooperation between the Federal Aviation Agency and the Weather Bureau.

For many years, all concerned have realized the value of pilot reports of the weather they encounter inflight. By Civil Air Regulations, pilots are required to report hazardous weather encountered, weather which would affect other aircraft, such as heavy icing, severe turbulence, et cetera. They are also encouraged to report weather routinely, whether hazardous or not, so that forecasters may put together more accurate pictures of conditions aloft than they can merely by use of observations from the ground. The importance of the augmented in-flight reporting system is brought out again later.

The preceding remarks have referred briefly to the major features of meteorological services and plans for reducing to the very minimum those uncertainties in weather information which may cause delays and accidents in air commerce. I have included brief references to many details in these plans. For a moment now I would like to take a more general view in retrospect.

I do not present the next paragraph as a mental exercise. I present it because I think it is all too easy for us, certainly in my case, to forget the vagaries of weather, to forget the frequent changes and the details.

It is easy to look out the window and say, "Well, there is the weather"—it is very simple.

Probably it is natural for most of us to generalize about weather and its uncertainties—that is, to oversimplify the case. For example, today we look out the window and see that the sky is clear and the weather fair, and it seems fairly simple to observe or measure and describe these conditions in a very few words.

But these are not the sum total of what the aircraft pilot or the farmer or the general public want to know. Weather conditions are not that simple when the practical requirements of aviation are under consideration. You may be surprised to know that in the navigable air space from the ground up to 50,000 feet over the United States the atmosphere normally produces every day many thousands of significantly different combinations of the various weather factors of importance in aviation.

This is during "quiet" weather. The large number comes from the variations in pressure, temperature, humidity, winds, cloudiness, visibility, et cetera, from place to place and hour to hour in the various levels from the ground up.

The weather reports and forecasts aim to describe these thousands of variations every day insofar as they are required by the pilot for his flight planning and his navigation. When the weather is stormy, particularly in winter with widespread general storms bringing rain, snow, sleet, icing, and gale winds, the number of different so-called kinds of weather for the practical requirements of aviation with its goals of keeping delays to the minimum and safety at the maximum may run up to hundreds of thousands in a 24-hour period.

This statement is more meaningful when we remember that over the District of Columbia, with its less than 1,000 cubic miles of navigable air space below 10 miles altitude, we may have several different kinds of weather at one time—heavy snow showers over one section, rain or fair over another—sufficiently different, which makes the difference between safe landing conditions and closed airports and these differing conditions may change from hour to hour or more frequently. This is well known, of course, but we forget it.

Although such diverse conditions do not usually cover more than a quarter or third of the country at one time, it is seen that with 30 million cubic miles of normal-use airspace over the United States and with bad weather conditions shifting constantly, the total number of separate reports and forecasts required to keep aviation and the public informed becomes very large. Wind variations aloft add to the number.

When meteorological coverage is extended to include conditions over the oceans and in countries overseas where international air transport and other business and economic agencies of the United States have interests, the different combinations of the weather elements every day reach an extremely large figure.

To meet these requirements the national meteorological services really need some means for scanning the atmosphere continuously throughout its extent so that the weather man can "see" and report all disturbances or obstacles to air navigation no matter when or where they occur. This knowledge has wide and important applications to many other fields in addition to aviation. Until radar was invented and developed for weather use, the meteorologist could only take samples of weather conditions—spot observations here and there—and huge gaps in his knowledge were unavoidable.

The radar is a major step toward "seeing" many of the disturbances in the atmosphere far beyond the range of normal vision of observers at weather stations situated far apart in comparison with the scale of weather factors which the aviator needs to know.

Another step toward providing more comprehensive coverage of observations in the airspace now having gaps in the network is provided in the augmented system of inflight reports mentioned briefly elsewhere.

This is a most important source of flight weather information that needs to be developed. Still another possibility that is being developed and may be closer than we think in use of meteorological satellites to obtain complete "bird's eye views" of storms and cloud systems now lost in gaps in weather observations over the oceans and other unpopulated regions.

Of course these are of importance to domestic operation because some of our most severe storms form rapidly and move in over the land with very little advance information.

Under the new system for inflight weather reports the FAA air traffic communications stations and their combined stations and towers will request and collect pilot weather reports for gaps on the weather maps as analyzed by Weather Bureau forecasting centers. At least once each hour, the FAA stations will summarize the pilot reports into a local area summary. This summary will be transmitted to the forecasting centers expeditiously where it will be coordinated with other factors that contribute to changes and new storm developments and the information will be included for teletypewriter transmission, weather briefing, and broadcasting.

Weather Bureau Flight Advisory Weather Service Offices will make larger area summaries, which will be transmitted on service "A" teletypewriters. This system, which will require the full cooperation of pilots as well as thorough coordination with weather factors from other sources entering into a complete analysis and understanding of weather developments, will give another positive procedure for increasing aviation safety.

Massive attack on meteorological problems: It is not necessary to prove to this committee that the weather problems of aviation are many and the need to find solutions to these problems are most urgent. All who travel the airways or are associated with aviation in any capacity are well aware of the pressing requirements for more and better weather information.

To solve the difficulties, particularly those to which brief reference has been made in these remarks, there are numerous research and development projects or programs now in progress. Considered all together these R. & D. activities constitute a much more comprehensive program than is generally known. They represent a "massive" attack. In the limited time available here I shall only mention the most important by way of illustration. We shall be glad to give further information if there are questions.

Acting under Public Law 657 of the 80th Congress as well as under the organic statutes of the Bureau the problems of severe storms, particularly hurricanes and severe local storms, are under intensive studies through the work of the national hurricane research project now centered at Miami, and the severe local storm center at Kansas City, commonly called SELS. High speed computers, laboratory equipped research aircraft and other modern and costly facilities are required for this research. To provide these facilities at minimum cost and with the best possible experimental equipment these R. & D. programs are cooperative, interdepartmental operations in which the FAA, the Air Force, Navy, NASA, and other agencies are working with the Weather Bureau in search of the best answers to questions in aviation involving weather.

Another major program is the general design for weather observing and forecasting system, commonly referenced by its project number—433–L. I mentioned this briefly a few minutes ago. Originally conceived as a military facility it is not an interdepartmental activity with FAA, Air Force, and Weather Bureau the most active participants. The Air Force serves as executive agency. At airports throughout

the United States 433–L aims to mechanize and speed up the entire system of weather observing and to transmit and process the reports quickly and compute forecasts by high-speed computers.

Senator MONRONEY. Could I interrupt there?

Mr. REICHELDERFER. Yes, sir.

Senator MONRONEY. As I understood from General Quesada's testimony yesterday, and from yours, this is the unification, you might say, of all of the weather information and reporting services of the Air Force and perhaps the Navy Meteorological Services, the Weather Bureau, and the FAA, is it not?

Mr. REICHELDERFER. This is true.

Senator MONRONEY. Up to this time everybody had their own weather and they were not changing or trading back and forth. You served the FAA, or CAA, but military weather information was strictly military, and unless a person happened to be a Member of Congress it was not opened very much to the public, or to be coordinated with your information and to fill in the gaps.

Mr. REICHELDERFER. Mr. Chairman, this is a common impression, but I am glad to say it is not correct. All of this information has, for years, fed into a common system, and people who go to military airports get the impression that it is a separate service because, of course, the military have their drops on the common system. They have their own forecasters for special purposes. This needs this amplification: The needs of aviation have always greatly exceeded the capacity not only of the transmission facilities but of the meterological service. The military, having greater flexibility in funds, has been able to move ahead in some of its needs more rapidly than the civil agencies have been able to do.

I would like to illustrate. The first weather facsimile system was started by the Air Force—the first general system. For a number of years they provided the trunk lines and the Weather Bureau had the drops on the circuit where it could afford to have facsimile machines on the circuit.

So even then, although the Air Force pioneered and operated the facility initially, it was really part of the common system, because it was used by Weather Bureau and other people.

That system has been transferred to the Weather Bureau by appropriations from Congress last year. So that it is easy to see how the impression is that there are several services that go their own way. Actually there is a remarkable amount of pooling and coordination, and has been by force of necessity right from the beginning.

The fact that the people want to know, and the aviator wants to know, always a great deal more about the weather than any weatherman, civil or military, can tell him, has forced us to exchange information so that we will all be able to do as much of a job as we can.

Senator MONRONEY. This now makes it a more formalized cooperation?

Mr. REICHELDERFER. You are quite correct.

Senator MONRONEY. Perhaps more standardized as to techniques, nomenclature, and other factors.

Mr. REICHELDERFER. That is correct.

Senator MONRONEY. So it is all now usable as a common system?

Mr. REICHELDERFER. This is quite true. It is an advanced integration.

Senator MONRONEY. The distribution is more of a common system?

Mr. REICHELDERFER. Yes, sir.

Senator MONRONEY. So we have drops for civil and military. Does this include the SAC weather, also?

Mr. REICHELDERFER. SAC weather gets its information from the common system. It has very specialized needs as you know. My understanding is that the SAC unit will continue to be a separate military nnit and I think it should be, because in a sense it is a specialized facility, and like the airlines meterological offices, it serves best if it is part of the organization it is serving.

Senator MONRONEY. It contributes to the common system of observation and reporting?

Mr. REICHELDERFER. Yes, sir.

Senator MONRONEY. There is no secret part of that? That part can be made known as to their observations and elements affecting domestic weather at least?

Mr. REICHELDERFER. This is true. The reports at home and abroad are fed into the common system. Earlier in this statement I referred to the importance of better methods for probing the atmosphere throughout in order to detect new disturbances immediately and track them continuously during their development and dissipation.

A very broad plan for weather reconnaissance aircraft squadrons equipped with sounding devices to probe the air above, to very high altitudes, and the air below the aircraft was visualized under project 460L.

This plan, undertaken by the Air Force, has been discontinued for the present because of unexpected obstacles. It is expected that extension of radar networks and further developments in meterological satellites will in some respects serve as alternatives. But they are not complete substitutes. There are still other programs and research or coordinating groups to whom weather and climate are vital factors and they are actively working on special aspects of meteorology. For the most part they are all directed toward the respective components of the general problems of advancement of meterology and its applied services to aviation, agriculture, et cetera.

That is a general statement and I would like to have time to go into specifics about these other activities. I put it in to show that there is really a massive attack, not only in the United States but in other parts of the world, on meteorological problems.

Turning for a moment toward the more fundamental approach: Several years ago, foreseeing that new requirements would be placed on the science of meteorology as the result of numerous technological advances in other fields—specifically the development of jet aircraft—which are more or less dependent on weather and climate, the Weather Bureau enlisted the interest and cooperation of several leading scientists here and abroad in developing far-reaching plans for advancement of meteorology as a science.

Among the actions taken has been organization of the Committee on Atmospheric Sciences of the National Academy of Sciences which has proposed actions to be taken for recruiting the necessary additional research talent in meteorology and for developing laboratories with greater research capabilities.

Supporting groups among the research institutes and universities of this country have been organized. Some of these proposals are now before the Federal Council for Science and Technology. The programs extend research into the hydrodynamics and thermodynamics of atmospheric disturbances into cloud physics including electrical phenomena and other fundamentals. Some of these studies are basic to development of theory and applications of weather modification or control to whatever extent these are possible.

The intensive attack on weather problems is in progress in scientific and meteorological service institutions abroad also in coordination with meteorological projects in this country.

Internationally there is probably as much coordination as there is in any other field except possibly the Universal Postal Union. We have remarkably good exchange of information, and remarkably good coordination in research information in research projects.

For example, the January 1 issue of the American Association for the Advancement of Science weekly periodical Science refers to these goals among others, which cooperative research agencies in Europe have in view—these are similar to those I mentioned above:

> To develop mathematical, hydrodynamic-thermodynamic models of the atmosphere to permit weather prediction by electronic machine numerical computation; and
>
> To discover the physical processes underlying water condensation and precipitation as the basis for weather modification.

In this connection it is of interest to note that the United States has done more in weather prediction by electronic computer and by common recognition has advanced further than any other country in its service applications of the numerical prediction method of general weather forecasting.

We have in operation and have had for several years, a 704 computer at Suitland.

This statement would not be complete without at least brief reference to the coordination of meteorological developments and services and the excellent working relationships between the FAA and the Weather Bureau. Cooperation in meteorology is unusually successful. There are regular channels through which coordination is obtained among the Coast Guard, DOD departments, the FAA, NASA, the Weather Bureau, and other interested agencies.

All of these and many others have vital interests in advancement of meteorology. Under the close working arrangements and the regular channels for coordination we have means for avoiding wasteful duplication and still retain the flexibility that encourages generation and development of new ideas and new solutions—a capacity for progress that is highly desirable in this important field.

Working arrangements also provide regular means for reviewing plans and activities and the aim is always to coordinate and make best use of research and service facilities. Under the statutes the Weather Bureau serves as the meteorological facility of the FAA and we have the most cordial and closely cooperative working machinery.

Meteorology is inherently a highly cooperative field because many other organizations and different fields of activity have vital interests in weather and also because the atmosphere is so vast and vagarious

in its behavior that cooperation in observing and reporting systems also is inherent.

We have the constant interest and support of the Administrator of FAA, Mr. Quesada, and his staff, and for our part we strive to maintain the organization and its services at top standards all of the time.

We recommend continued support of the comprehensive plans for development of aviation weather services—plans based on the considered conclusions of the participating agencies as the best way to bring under control those weather factors involved in safety and efficiency in aviation.

I have not gone into detailed plans except with the chart. They are contained in the 5-year plan pamphlet which has been issued and is available. These cover the most immediate actions to overcome the recognized deficiencies.

Thank you, Mr. Chairman.

Senator MONRONEY. Thank you very much, Mr. Reichelderfer. We appreciate your completeness and the care that has gone into the preparation of this statement, and also from your statement the continued emphasis on the casual factors of aviation accidents where weather has been at least one of the contributing factors.

The figure of approximately 70 percent of the total number of fatalities which you quote from the Civil Aeronautics Board can be attributed to at least a factor of weather being involved and something we must continually bear in mind, particularly since it affects general aviation particularly and peculiarly.

I am delighted to know that steps are apparently being taken to speed up the reporting, keep it current, and to make it understandable, and also available to pilots before they get airborne.

Private pilots sometimes have a hard time when the weather is marginal of ever getting through to the Weather Bureau because everybody else wants to know whether to put on their long underwear or wear their mink coat to work that day. The poor pilot taking off is often delayed maybe an hour or so in trying to get the weather. This automation of the call numbers or the charts and graphs will help materially.

I was very interested in the fact that you are activating many of the low-frequency radio range transmission stations that apparently were not giving full 24-hour weather service. I would like to ask how many weather observation stations you have throughout the country domestically.

Mr. REICHELDERFER. The number under the Weather Bureau itself is roughly 300. This, of course, refers to our full-time stations or our Weather Bureau stations.

Senator MONRONEY. These are 24-hour stations?

Mr. REICHELDERFER. Not all of them are.

Senator MONRONEY. What percent are 24-hour?

Mr. REICHELDERFER. We may have to furnish you that figure. I would say, as an estimate, that 75 or 80 percent are 24-hour stations. I will correct that for the record if there is a change.

Senator MONRONEY. If funds would be made available by the Congress, do you feel that a hundred percent coverage of your own primary 300 stations would be desirable for filling in the gaps or helping to fill in the gaps?

Mr. REICHELDERFER. I think this is obvious, Mr. Chairman, yes. The stations were selected in the first place to provide a systematic coverage. When they are not operated continuously, it means that during the nighttime hours there is a gap in essential weather observations.

Senator MONRONEY. That 20 or 25 percent that are not 24-hour, what are the hours of service they cover?

Mr. REICHELDERFER. It varies. A few are only 12-hour. Most of the curtailed stations are 18-hour.

Senator MONRONEY. Twelve- to eighteen-hour stations are 20 to 25 percent?

Mr. REICHELDERFER. Yes, sir.

Senator MONRONEY. What other stations do you receive weather observations from?

Mr. REICHELDERFER. There are also some 250 FAA stations where there is no Weather Bureau station because the traffic has not yet reached the stage to prevent the FAA from taking the simple basic weather observations for us. They serve as practically part of the network.

Senator MONRONEY. They feed into the network?

Mr. REICHELDERFER. They do.

Senator MONRONEY. Can you tell me what percent of those are 24-hour stations?

Mr. REICHELDERFER. I think those are all 24-hour.

Senator MONRONEY. Are those manned by meteorologists or by professional men qualified as weather observers, or are they manned by old-time but very practical and weather-wise aviation personnel?

Mr. REICHELDERFER. On the whole, these are taken by the latter people, by communicators and others who have other main duties, and they can find time to take the weather observations hourly without interfering with their communications or other duties.

Senator MONRONEY. Do you find them rather competent in the field of furnishing the information?

Mr. REICHELDERFER. The cooperation has been so close that it is fairly satisfactory, yes. We provide the inspection for the services, and for the most part with respect to their weather observing functions they are part of the Weather Bureau.

Obviously, fully trained weather observers see some things that an untrained observer or an observer who has other duties cannot see. It is not always possible for the stations, where they have other duties, to see changes in weather that are of significance. But this, of course, to be quite honest, is true with some Weather Bureau stations, because they have to transmit their reports, and sometimes conditions develop and there is a few minutes delay in getting the reports on the teletype.

Senator MONRONEY. You mentioned on page 7:

> As I mentioned previously, work is progressing rapidly to bring to full operation the 88 low-frequency radio range transmissions of weather information.

And then you changed it to "continuous broadcast of aviation weather." Is that in addition to the 250 FAA stations?

Mr. REICHELDERFER. Yes, it is. Most of these range stations are near an FAA facility of some kind because FAA operates the station. It is not in addition to their presently established network, no.

Senator MONRONEY. What do you mean by "full operation of the 88 low-frequency radio range transmissions"?

Mr. REICHELDERFER. There is a conversion necessary from their old-time use to the weather use. The FAA is making this conversion at the rate of several a month. So that it will not be too long before all of them——

Senator MONRONEY. How does it help? I am sure the way you stated it, it must be true that it will be more helpful when these 88 are in. Tell us how it helps improve your weather observing or reporting.

Mr. REICHELDERFER. I misunderstood. These 88 stations are not reporting channels, they are dissemination channels.

Senator MONRONEY. In other words, they are transmission channels?

Mr. REICHELDERFER. That is right. That is why I said they didn't represent additional stations to the present CAA network. These stations do not observe and report the weather conditions, the stations on the chart. They serve as the channels for getting to the pilots in the air, particularly. They can be heard on the ground, too, but not as satisfactorily, the results of all the weather information, and the analysis of the charts and the forecasts. This is a channel for getting the knowledge, the collected knowledge out to the using pilot.

Senator MONRONEY. In getting these weather changes which come in hourly from the observations on a control tower, say, 75 miles away from where there has been a very violent weather change—and we have some very violent ones, I can assure you. Two months ago with a 5-knot wind from the south, on a 35-minute flight, on a balmy flight, it went below freezing, and it could change that rapidly in Oklahoma with winds up to 35 knots out of the north. I am happy to say that the stations did get that transmitted into the destination point.

Ordinarily, can you get a violent weather change that perhaps is contrary to all forecasts transmitted within an hour so en-route pilots would be able to know what they would encounter?

Mr. REICHELDERFER. That is the aim. I think I have to explain a bit in order to give a satisfactory answer.

If the violent weather condition is a severe thunderstorm or tornado, anything that produces heavy precipitation, then the radar does enable the observer to pick it up immediately and he can see, say, a 250-mile radius. This brings out the tremendous advance the radar represents in seeing the atmosphere throughout, because previously the only way you would get reports of that kind was for somebody's eye to see them. There was a delay in getting reports in.

We have improved very much in promptness of detecting disturbances of that kind, and getting them into the analysis center and out on the air to the pilot.

I would say your statement "within the hour" is correct for that kind of disturbance. Usually it is only a matter of minutes to get the information out to the pilot.

However, there are many other things that are not picked up by the radar at the present time. Clear air turbulence is not detected at the present time.

Senator MONRONEY. In other words, a dry front?

Mr. REICHELDERFER. That is right.

Senator MONRONEY. You can't pick that up?

Mr. REICHELDERFER. That is right.

Senator MONRONEY. And it can be very violent, at least in change in wind velocities and directions?

Mr. REICHELDERFER. Yes, sir. There is hope that radar can be developed so that you can see these invisible things. There are discontinuities in the air accompanied with them that serve as a physical basis for measurement. This is not hopeless. But this takes much more research.

Senator MONRONEY. Then you need the ground stations, to know which way the wind sock or gages are working?

Mr. REICHELDERFER. Yes, sir.

Senator MONRONEY. Are you satisfied that you have sufficient radar coverage in your long-range radar?

Mr. REICHELDERFER. We don't have authorization for the entire country as yet. We do have authorization, and funds, for most of the country, with the exception of the quieter areas, some of the west coast and part of the mountain areas where the terrain and isolation is not very good for present radars.

I would say the answer to your question is that we are two-thirds satisfied.

Senator MONRONEY. Has Congress appropriated enough money?

Mr. REICHELDERFER. For this system, yes, for the two-thirds. Not the entire amount.

Senator MONRONEY. To get the other third covered, the blind spots, it would require additional appropriations?

Mr. REICHELDERFER. Yes, and more research and development of radar. It will require additional appropriations and additional research and development.

Senator MONRONEY. On weather radar you have very great precision and you also almost warn a pilot at which point he will reach clear air or reach a cold front and what magnitude it will be.

Mr. REICHELDERFER. That is right.

Senator MONRONEY. Do you feel that there will be, though, a continuing need to fill in this additional third in the stations on radar, and also it will at least contribute to aviation safety if the 20 percent of the part-time stations were directed to be 24-hour stations?

Mr. REICHELDERFER. Yes. We are on record as having made that statement. That is true.

Senator MONRONEY. You have already recommended that, you say?

Mr. REICHELDERFER. Yes.

Senator MONRONEY. You have recommended it for appropriations this year?

Mr. REICHELDERFER. Yes, we have.

Senator MONRONEY. Do you have technical people and confidence within personnel so that if Congress gave you full-time, 24-hour service in this 20 percent of your 300 stations, that they could be manned and could go into operation? There is no other requirement or delay for equipment or anything of that kind; it is just people; is that correct?

Mr. REICHELDERFER. Primarily that. There would have to be a training program. But this could be done over a period of a few months—several months.

Senator MONRONEY. Senator Engle?

Senator ENGLE. What is the difference on this map between the circles without the gray coloring and those with it?

Mr. REICHELDERFER. The ones that are shaded, the installations are already in operation. There are 11 of those.

Senator MONRONEY. They are already in operation?

Mr. REICHELDERFER. Yes, sir. That is, they are in operation for the weather dissemination service. The others have not been converted yet by FAA. The Weather Bureau does have funds to staff them as soon as they are converted and they are being converted at the rate of several per month.

Senator MONRONEY. I am a little puzzled by that. Is that all that you have that are broadcasting aviation weather?

Mr. REICHELDERFER. That gives a complete coverage except for one little portion in Utah.

Senator ENGLE. Looking at the map it looks like the only one you have in my State is in Los Angeles.

Mr. REICHELDERFER. Los Angeles is the one that went in first. There were some tests in Washington, but the Los Angeles station was one of the first. This is true, and they are being put in, Senator, just as fast as the FAA can make the conversion from the former use to the new.

Senator ENGLE. You are going to make weather broadcast stations of the low-frequency ranges, is that it?

Mr. REICHELDERFER. That is correct.

They have to make changes in the electronic equipment and install the tapes. This takes some little time. FAA is going ahead with the conversion just as fast as they can.

Senator ENGLE. And the actual communications with aviation traffic control will be throughout stations such as omni-stations?

Mr. REICHELDERFER. Yes, that would be mostly through land lines. This is to get the information out to the pilot in the air, and it will also, we hope, relieve some of the telephone congestion when in bad weather the pilots on the ground can't get through to the Weather Bureau.

Senator MONRONEY. That sounds like a very interesting thing to me. In other words, the same information that will be going out to the pilots in the air can be reached on a dial system such as if you call for the time of the day here, is that correct?

Mr. REICHELDERFER. Yes.

Senator ENGLE. Are these going to be recorded broadcasts? Let's assume that I am a pilot flying an airplane and all I have is a low-frequency radio. I will tune in and this broadcast comes on as it does in Washington. If I want to talk back to them would I be able to talk over my low-frequency radio or not?

Mr. REICHELDERFER. Not to this particular facility. You would still have to contact the control tower or the other regular facilities channels for getting weather information. The towers, your two-way radio communication, the FAA end of that, would have the same information available. So you could ask questions and get it that way.

Senator ENGLE. I was trying to find out whether or not they would make these automatic transmission points without personnel there.

Mr. REICHELDERFER. No, there will be personnel there.

Senator ENGLE. How do you get the winds either to report them or forecast them, when you have a complete cloud cover? You can't send it to the moon.

Mr. REICHELDERFER. We use the so-called radio wind sounding balloon. It is a special form of the original radio sounds that we had in use for 20 or 30 years, and it uses a direction finder—radio direction finder to find the position of the balloon even when the balloon is invisible beyond the clouds. The track of the balloon is plotted in the same way that the pilot balloon, the visual, is plotted. I say in the same way, but it is the same principle. Actually the "GMD" equipment that we now use is automatic. It solves most of the thing automatically without hand plotting that we had to resort to earlier.

Senator ENGLE. Have you initiated any kind of a program which would relate the forecast or the reports of existing weather to actual conditions as observed by pilots? Let's take, for instance, the route between here and New York, or from here to Chicago. There is enough air traffic along there that certainly those fellows know what they have. They know whether they have a headwind or a tailwind. They can figure that out.

Have you ever gone into an exercise in which you took your forecast for a particular time between here, say, and Chicago, and your actual reports, and compared them with what the pilots found them to be at those places where the weather service said it was going to be a particular wind in a particular direction, and so forth?

Mr. REICHELDERFER. The forecaster really does that continuously. He makes his forecast on the bases of the information available now and then he watches as the new reports come in to see whether the conditions are as forecast.

The missing link—and there has been a missing link—is that all of this information is perishable. You need it so fast that it will not be of any use if delayed an hour or two. You need it right away, now.

The communications problem, to get reports from the pilot in the air, is rather difficult. The individual air carriers do have constant communication, and for their own routes they have up-to-the-minute information.

We have some facilities for connecting into their information and getting that into the Weather Bureau offices and FAA offices. But this has not worked out as well as we expected when we started some 10 years ago, primarily because of communications and because it takes a lot of staff to keep up with all these things.

Part of the plan visualized here, part of what we are asking for this year, would give more inflight reports and would provide the exchange much more efficiently so that everybody would get all of the information.

Senator ENGLE. Thank you very much.

Senator SCHOEPPEL. I would like to ask you a question.

On page 2, at the beginning of that page in your statement, you indicated that the statistics show that there has been a gradual increase in aircraft accidents, primarily due to weather, during the last 25 years.

Obviously in your service you have had great improvements, technical advancements, and greater dissemination of data and informa-

tion, as you pointed out in your statement. In accidents due to weather, do you attribute a percentage of the increase to the terrific increase in flyers, especially the last few years, or has something developed on the weather side that these men flying aren't aware of or careless about?

Mr. REICHELDERFER. It is due primarily to the great increase in general aviation traffic.

For example, a pie chart that I have before me indicates that planes in the air, general aviation, at the present time has 63 percent, military 35 percent, airlines about 2 percent.

In hours in the air, general aviation 43 percent, military aviation, 41; airlines, 16 or 17.

So that the accidents have come primarily from the fact that there are more private pilots, more pilots who are flying—I shouldn't put it that way. Pilots who are on private business and are not under the same rigid operation that the air carrier operations are.

We could give you many examples. We have, by way of illustration, a pilot in Pennsylvania who ran into some weather that he didn't expect a couple of weeks ago. He almost got in serious trouble. We always investigate this. When we checked through, we found that the reports in this case were correct, but he didn't understand the terms. It is even thought that perhaps he didn't clearly understand the difference between instrument flying conditions, or noninstrument flying conditions—visual flight rules—and CAVU.

It is rather incredible that there should be this ignorance, but you do find cases where people take the air when they are really not prepared to take the air.

Senator SCHOEPPEL. That explains to me some reasons for this upward statistical picture on these accidents. Obviously your service has been greatly expanded. It has become more scientific with much quicker dissemination of information all over the country. So we can readily say that the men who are at the controls of these ships, private, commercial, military, or otherwise, have information accessible to them if they would use it, generally speaking. Wouldn't you say that?

Mr. REICHELDERFER. Certainly there is a great deal of weather information available to them. It wouldn't be a faithful picture if I didn't say that there are cases when storms develop without our being able to detect them.

Senator SCHOEPPEL. Even in those cases you attempt to alert as quickly as possible, and almost instantaneously after reporting.

Mr. REICHELDERFER. Yes, we do.

Senator SCHOEPPEL. What would you say in a nutshell would have to be done to make your service more efficient now in the greater interest of safety? Would it be additional funds, additional technological experimentation and research? Just what would it be in a nutshell?

Mr. REICHELDERFER. Senator, we need certainly additional research. In dealing with the atmosphere we are dealing with one of the most complicated things. Sometimes to show how much research there is to be done we say that we don't even know why and how rain is formed. This is an oversimplification. We know a lot about it. But we don't know enough about it to predict accurately the quantity of

rainfall. We don't know what effect the different kinds of nuclei on which the raindrops condense, what effect, how large a determining factor this is. We don't know how large a factor the electrical field in a cloud is in forming rain.

Obviously without this knowledge we can't give the quantitative analysis and prediction that is needed not only for aviation but for other things, because the quantity of rain determines the visibility and other hazards in the air. There is a great deal of research and development that is necessary. This, of course, involves funds.

Senator SCHOEPPEL. What about new men going into your type of activity. Do you find that you have available manpower interested in carrying it on, or do you have a shortage of men?

Mr. REICHELDERFER. There is a shortage in meteorology as there is in most technical and scientific fields; a shortage primarily in top-flight research people. We are not particularly short in observers and technicians. A little trouble, but the serious shortage is in the Einstein's and the people that will bring the breakthrough in meteorology.

Senator SCHOEPPEL. Thank you very much.

Senator MONRONEY. We are pleased to have sitting in the hearing room a jet pilot in his own right and a Member of the U.S. Senate, Senator Goldwater, who probably has racked up more hours in jets and probably reciprocating engines than most pilots.

Have you any questions you would like to ask?

Senator GOLDWATER. Mr. Chairman, I came over to listen to this. I wanted to get to some of the other hearings, but other committee meetings prevented it. I do have a few comments on this.

First I would like to compliment Mr. Reichelderfer and his entire organization as a pilot for the exceptionally fine meteorological services that they give pilots in this country. I have flown in many countries, and I have never experienced anything like the completeness of the services we have.

I want to compliment you and your entire organization for the type of work you are doing.

Mr. REICHELDERFER. Thank you.

Senator GOLDWATER. I have always been interested, and I know Senator Engle shares this interest, in the amount of cooperation you are getting out of the west coast of Mexico on weather information. Are you getting full cooperation there?

Mr. REICHELDERFER. We are getting reports from Mexico. It is one of the areas from which there is not sufficient reports. The United States is furnishing much of the equipment for reports for Mexico. We have tried over the years, through the State Department directly, to obtain more from the Mexican Meteorological Service itself. Quite specifically we need more reports from Mexico, not only for aviation but since this is the area from which we get much of our moist tropical air that provides the supply of water for rainfall over the southwest and over a part of the Mississippi Valley, it would be extremely helpful. In fact just the other day I got another request from our principal analysis unit, the numerical weather prediction unit, that they were very much handicapped by lack of upper air information from the west coast of Mexico and from the waters down to the west and southwest.

Senator GOLDWATER. Have you discussed with the State Department the possibility of assisting Mexico if she is not able to provide the full service, to obtain hourly reports along the west coast and the east coast also, but particularly the west coast?

I ask you that because we in the Southwest are harassed by unpredictable storms throughout most of the year that flow into the Nevada low from the Gulf of Lower California.

Have you discussed this with the State Department, or any other bureau of our Government which might be in a position to give assistance to Mexico if she is not able to provide that at the present time?

Mr. REICHELDERFER. Yes. This is a subject of more or less a continuous communication, much of it, all of it at a high level in the State Department, but much of it at a lower level where we deal directly with the Mexican Meteorological Service or other officials.

The United States now is furnishing the upper air sounding equipment and the expendables, the balloons. I am very sure that the Mexicans would be very glad to have any additional help. It is a question of funds.

Senator GOLDWATER. Thank you. I have a suggestion or two to make. One is relative to the trouble that Senator Engle, who is a pilot, has expressed, and which we all who fly run into. The minute a cloud appears in the sky everybody calls the Weather Bureau—anything that is named Weather Bureau in the telephone book.

Why would it not be possible to put flight weather under "Flight planning"? The general public would not think of calling flight planning to call for weather. Let the Weather Bureau continue to tell the housewife that she can't hang her laundry out today, and the hunter that he had better not go out to the high country. But if we could pick up the phone and call "Flight planning" and in the course of flight planning get weather information, I think that might help to alleviate the trouble that the pilots have when we are in a hurry for weather and cannot get it over the phone.

Mr. REICHELDERFER. I am sure this can be done. We do have in most of our large offices an unlisted, in some cases two or three unlisted phones, the number of which is published in the "Airman's Guide."

So that aviators, the pilots, have access to it. Very few of the general public know about it. We change these numbers from time to time when people get on to it. But if you think that the pilot would be more likely to look up the number under "Flight planning," there is certainly no reason why we cannot do that.

Senator GOLDWATER. The public gets the other numbers?

Mr. REICHELDERFER. Yes.

Senator GOLDWATER. I have on a page of my phone book at home listing the Weather Bureau at least six different numbers that have been changed through the years. That is caused, they tell me, by the public looking in the "Airman's Guide" or having a pilot friend say when you want weather call this number.

Mr. REICHELDERFER. That is the point.

Senator GOLDWATER. I suggest flight planning, because the average housewife or the average man in the house would not think of calling it unless he wanted to go some place in an airplane.

Senator MONRONEY. Would it not be a good idea to list it under FAA instead of the Weather Bureau?

Senator GOLDWATER. They would find it sooner or later.

Another point, and this I do not apply to you, and some of these remarks that I make, Mr. Chairman, I will be very brief with. It is just things that might help.

Many a time pilots will call into a tower when they come into a control zone, or call approach control, and ask for the local weather. You will have read to you the last sequence, when all the operator has to do, because he is in the tower, is look out and tell you what the ceiling is, and what the visibility is.

I have had many occasions when I have gone into my destination and asked an approach control what the weather is, and get the last sequence, and find in my traffic pattern that it has no relation to the current weather. That would come under FAA and not under you.

Mr. Chairman, if you would allow me, I would like to make a few comments on this general subject.

Senator MONRONEY. We would appreciate having them.

Senator GOLDWATER. I probably won't be able to get back because of other work. I have had a long interest in this. I have had occasion, as all pilots do, to gather some ideas on the subject.

First of all, most accidents in weather are caused by pilots who should not be in that weather. I have made a suggestion from time to time that I know is not a popular one, but I think before any private license is issued the trainee should be subjected to at least some instrument training.

I don't mean enough to call for an instrument rating, but certainly enough to let him know whether he is upside down, turning to the right or left, and how to make a 180 degree turn and get out of weather.

The objections to that have been based on the additional cost to the trainee. I think no matter what the additional cost may be, it would be worth it to the man to save his life and to prevent the possible loss of life to people who are near where the aircraft might fall.

Senator ENGLE. Will the Senator yield?

Senator GOLDWATER. Yes.

Senator ENGLE. Present FAA regulation would require basic instruction, somewhat along the line the Senator refers to, in connection with the private license, and in connection with a commercial license, 10 hours of instrument instruction.

Some time ago the AOPA initiated this 180 degree training course, which is an excellent thing, and the current FAA proposal with reference to private licenses somewhat parallels it. From my point of view I think it is a good thing.

Senator GOLDWATER. I am glad to hear that the FAA is considering it. I frankly would not give a commercial license without an instrument rating. The only value a commercial license has over a private license is that you can haul somebody around for pay. I do not think a pilot ought to be flying anybody for pay who cannot handle himself in weather.

In all my years of flying, Mr. Chairman, I have never been asked to show my pilot license. I have never been asked, when filing an

instrument clearance, to show my instrument rating. I have never been asked to show my medical certificate. I think that is a weakness that has to be corrected.

I do not think it is even sane to allow a pilot to walk into a clearance office, file a clearance in instrument weather, who has not an instrument card.

I know of case after case where that has been done. I know pilots who have flown into weather, knowing what they are going to get into, but trusting to God that there might be a hole some place, or that there might be a little bit of a ceiling, that the forecaster might have been wrong.

I would suggest that we tighten up on the inspection of pilots. I do not think a pilot should be given a ticket and then go 30 years, as I have, without ever receiving a request to show my license or my ratings, or an occasional check by a check pilot to see whether or not I am proficient.

In that respect I have even gone so far as to suggest a minimum amount of time that had to be flown each month or each quarter in order to retain a license.

In that respect, I am heartily in accord with General Quesada's desire to toughen up the operation of our airways. I believe, and I disagree with my good friend from California on this, I agree with him on his medical checks, that they should be given by a doctor trained in aviation medicine, and not by your own personal doctor, because I know my own doctor I can do pretty much what I want to with. I disagree with General Quesada on the 60-year olds. That might be because I only have about 8½ years to go to reach that age, and I have every intention to keep on flying if the medical checks are OK after that time. I hope he reconsiders that, as I have had an interesting experience a year ago. I was flying Western Airlines from Salt Lake City east, and I saw this name on the pilot's board, and I said "My God, he can't still be flying; he flew in my squadron during the war and he was then over 50."

I sent a note up and complained about the quality of the flying and I knew he would come right back.

Senator MONRONEY. I am sure the Senator knows, and we must continue to reemphasize it because there is so much misinformation abroad about it, that 60 years does not apply to private pilots.

Senator GOLDWATER. I know that. If it does not apply to private pilots it should not apply to airline pilots. We have to keep this in mind. We private pilots, we people who fly our own planes, can kill just as many people as an airline pilot. And the rules that apply to airline pilots, so far as medical checks and aids, certainly should apply to the flying public. If it is good for one it is good for all.

Senator ENGLE. Tell us the rest of that story.

Senator GOLDWATER. The rest of the story is that I went up forward with him and said "My God, are you still flying?"

He said "Yes." I said "How long are you going to fly?" He said "They pressurized these things and put on all the pilots and I don't have to work too hard any more. I am going to fly just as long as I can pass my medical checks."

He is a wonderful pilot. There is a man who, if he can pass a physical at 75, I will fly anywhere in the world with.

Senator ENGLE. The Senator has been flying for 30 years and I suspect that he is a better pilot today than he was the first year he ever flew, when he was a pretty young fellow.

Senator GOLDWATER. I don't know about that.

Senator ENGLE. I think that generally speaking, as pilots get older, they are more cautious, and their experience pays off a lot.

I have been flying for 20 years, and I am prepared to say that I am a safer pilot today than I was in the first 5 years I was flying.

Senator GOLDWATER. I would agree with the Senator. If we would accompany the advancing age with continuing checks. In other words, go to the Air Force system—no, the Navy must have it—I am acquainted with the Air Force. We have to take an annual instrument check. We have to take annual proficiency rides, and we have to keep current in the aircraft we are flying.

Let's spread that out to the private pilot. Sure, we can get in an airplane that has wings on it and we say we can fly it, but can we fly it safely? That is what we have to work for.

Senator COTTON. Will the Senator yield?

Senator GOLDWATER. Yes.

Senator COTTON. I will be 60 next May. The only thing I find is that I don't fly as high as I used to.

Senator GOLDWATER. One other thing, Mr. Chairman, before I go. I think we ought to go back to the old rule of requiring clearances for all flights. The fact that the private pilot today can merely crawl in the cockpit and go, I think we should stop. I know it is a lot of bother, and I have been just as guilty of not filing clearances as any pilot, but I think in fairness to other pilots, and fairness to the safety of the airways, that we ought to be required to file, even if it is VFR and under 10,000 feet, we should file clearances.

Senator ENGLE. Will the Senator yield?

Senator GOLDWATER. Yes.

Senator ENGLE. Does the Senator think I ought to file a flight plan if I want to go out to the Washington-Virginia Airport to take a country ride to keep my proficiency up?

Senator GOLDWATER. I think it is a field that we have to look into, Senator. I would not say that we should require that, although you can cause more traffic congestion by that kind of flight than any other kind of flight that I know of around a busy airport.

Of course if you have radar it is no worry. I would suggest to the chairman that in his recommendations to the FAA that he include a recommendation that this whole clearance subject be reviewed, with the idea that we can make exceptions for the type of flight that the Senator has suggested, but on a flight from one point to another I think it is fair to other flying people that they know who else is up there with them.

I thank the chairman for allowing me to make my remarks.

Senator MONRONEY. We appreciate the contributions which the Senator has made. I want to ask one question about the Capital Airline plane that went down in disturbances over Westminister.

This weather condition had been forecast, had it, in that area?

Mr. REICHELDERFER. The severe thunderstorms, the thunderstorms had been forecast. This was an occurrence not only tragic but very interesting to us because it appeared to be a case of very severe turbulence away from the main storm.

We have had some rather extensive studies. In part the studies substantiate that there were very severe vertical currents, turbulence that developed in the vicinity of the plane.

I think it will never be fully established just what the meteorological conditions were because this is one of the gaps in our observing system.

Senator MONRONEY. Your report and the information that was currently available to pilots at that time was for severe thunderstorms in that area?

Mr. REICHELDERFER. Yes.

Senator MONRONEY. Therefore would you say that under the presently known capabilities of the Weather Bureau ground station that when you can locate and designate an area as a condition of severe thunderstorm activity, then the only other answer, if that is to be transmitted to aircraft, is through the help of airborne radar.

Mr. REICHELDERFER. That is true. Eventually the high-powered ground radar will be able to see some of these things which are now invisible. But your statement certainly is true as of now.

Senator MONRONEY. And the proposed rulemaking by FAA for the carriage of radar on commercial type aircraft, would comport with the need of filling in the now unknown specific location from minute to minute of this severe turbulence?

Mr. REICHELDERFER. This seems quite true.

Senator MONRONEY. And also helps of course in locating fronts and precipitation and things of that kind?

Mr. REICHELDERFER. Yes.

Senator MONRONEY. Is there any way that the radar will pick up icing as distinguished from light snow or things that are not troublesome in the air?

Mr. REICHELDERFER. The reflection, the return you get from ice and snow, is somewhat different. But at the present time the differences are not sufficiently unique to be sure of. But this again is a refinement that will undoubtedly come with further development of radar.

Senator MONRONEY. There was nothing that the Weather Bureau failed in, so far as you know, in the forecasting of this turbulence, the thunderstorm activitiy?

Mr. REICHELDERFER. We think, in all fairness, that the forecaster did as much as the science permits at the present time.

Senator MONRONEY. Do you think you have or will soon have sufficient long-range weather radar coverage to pinpoint almost throughout the country excepting as you said in certain high mountains areas where difficult conditions obtain, the ability to scan the skies so that you will have an ever-increasing, at least, pinpointing of the local areas in which the violent thunderstorm activity is occurring?

Mr. REICHELDERFER. We are sure of this, yes.

Senator MONRONEY. This can be avoided then by changing the flight plan to fly around it?

Mr. REICHELDERFER. Yes.

Senator MONRONEY. They are not usually over a large section, although they sometimes are.

Mr. REICHELDERFER. Normally they would be flown around. They are limited. But the very nature of things, thunderstorms which are caused by or attended by violent up-currents, there is a limit to the

extent of them because you couldn't possibly have the air all over the surface of the earth rushing up at the same time.

Senator MONRONEY. There are two accidents that occurred in explosions in midair apparently, where the plane was lost in midair, one the Delta Airline DC–7 in the gulf and the other the recent National Airlines crash in North Carolina. Could you detail what the weather conditions were, or any unusual weather conditions that might have been contributory or had any bearing on this?

Mr. REICHELDERFER. Yes. The early part of the flight, in the crash in North Carolina, had been in rainy weather—system rain. But a careful study of the conditions in the vicinities of the crash did not give any reason to believe that there was unusual turbulence at that spot at the time the plane was there.

It is less certain with respect to the accident in the gulf. There may have been a front in the vicinity. But there is only a limited ability to fix the position of fronts over the waters of the gulf, and we can't be sure at the present time just what the conditions were.

Senator MONRONEY. It wasn't very far from New Orleans. He was, I think, on New Orleans control at the time that he apparently crashed. The weather would have been subject to weather radar up there, would it not?

Mr. REICHELDERFER. Yes. It was 75 miles off the Mississippi coast, and the weather at the time along the coast, and apparently over the gulf, was fog and stratus clouds with low ceilings and low visibility, with tops about 3,000. But there was nothing in the weather information, in the weather reports we have been able to gather, that showed anything at the flight level that was unusual.

Senator MONRONEY. In other words, there was no severe turbulence, as far as the Weather Bureau knows, in any of the areas in which the plane was flying?

Mr. REICHELDERFER. This is the case.

Senator MONRONEY. When we have an accident such as this, where an unknown factor could exist, do you make special efforts with your people to try to collect any kind of unusual weather data or double or triple check the possibilities of a sudden squall or a line or something that might have contained unusual turbulence?

Mr. REICHELDERFER. We take those steps immediately in every case, and that information is brought to my attention personally. We try everything we know to get additional information that will shed the light and answer any questions about weather conditions that might have been involved.

Senator MONRONEY. So far as has been determined after careful check, there was no weather factor that could have been sufficient to disintegrate either of those planes?

Mr. REICHELDERFER. In this case, this is correct.

Senator MONRONEY. Senator Engle?

Senator ENGLE. I have nothing further.

Senator MONRONEY. Senator Thurmond?

Senator THURMOND. I have nothing further.

Senator MONRONEY. Senator Bartlett?

Senator BARTLETT. I have nothing now.

Senator MONRONEY. Thank you very much, Mr. Reichelderfer. We hope that the funds that might be provided in the budget message that we expect momentarily from the President will be sufficient to

give you enough money to carry out a modernization and filling in of the gaps, particularly on these 60 weather stations which are still only part time. I know you would be reluctant to comment on the budget at this time. You will be before the Appropriations Committee.

Mr. REICHELDERFER. Very shortly. In fact, I am scheduled for it tomorrow.

Senator MONRONEY. That is the House?

Mr. REICHELDERFER. That is the House.

Thank you, Mr. Chairman. There are provisions for increases. The 5-year plan to which I made reference will certainly take care of the major immediate steps that we think are necessary to bring the meteorological service up to requirements.

Senator MONRONEY. Many, many elements in aviation, but particularly the Executive Aircraft Association and the airline owners and pilots, are very interested in that. This certainly is one of the ways that the services of the Federal Aviation Agency can, in cooperation with you, help us eliminate the casualty list which annually outruns, in the general aviation field, the total casualties caused by all the airline operations. The airline operations have their own specialized information, taking it from the data you supply. We want to fill in as many gaps as we can so that the information will be competent for those who do not have their own information, such as private pilots and those flying in general aviation.

We thank you very much for your help and your appearance here. We will not need any further service, unless you have a question, Senator Thurmond.

Senator THURMOND. No.

Senator MONRONEY. The committee will stand in recess until 2 o'clock. I would like to announce to the press that we are going into executive session immediately. We may have an announcement, I do not know, that might be of interest to you at the conclusion of the executive session.

Senator ENGLE. Mr. Chairman, relative to our meeting this afternoon, I have been advised from our side of the aisle that we can anticipate a rollcall. This matter is of very great interest. I am reluctant to miss any of these hearings. What are we going to have this afternoon?

Senator MONRONEY. We have first scheduled, supposed to appear today, Mr. Tipton, representing the Air Transport Association; followed by Mr. William K. Lawton, executive director, National Business Aircraft Association; Mr. Joseph B. Hartran, president of the Aircraft Owners and Pilots Association; and Gen. Joseph P. Adams, president, Association of Local Transport Airlines.

We didn't expect to clear all of these. Tomorrow is Friday and we expect to sit tomorrow. If we can get at least one or possibly two of these witnesses before us, and if we have succeeding numbers of rollcalls, obviously the committee will have to recess and go over until tomorrow.

I think until we find how much talk there is in this bill, we will ask unanimous consent to sit until it becomes obvious that we can not conduct the hearings and vote as well on the floor.

Would that be satisfactory to the committee?

Senator ENGLE. It is not very satisfactory.

Senator MONRONEY. It is the best we can do.

Senator ENGLE. I understand the chairman's difficulty.

Senator MONRONEY. We would like to move this along. We have a lot of other subjects. Let's start at two. If we run into difficulty on numerous rollcalls, we obviously will have to recess. There might be a great deal of talk early in the afternoon which we might be able to read later in the record and we could at least attend to our business here in the committee until that time.

The committee will stand in open recess until 2 o'clock. We will go into executive session now.

(Thereupon, at 12:12 p.m., the subcommittee was recessed, to reconvene at 2 p.m., the same day.)

AFTERNOON SESSION

Senator MONRONEY. The Subcommittee on Aviation of the Interstate and Foreign Commerce Committee will resume its hearings on aviation safety.

Upon adjournment of the regular meeting this morning the subcommittee received in executive session some testimony about leads that the Civil Aeronautics Board investigators were pursuing. Because of the vital importance of these matters to the flying public and to the cause of this investigation we felt that it was quite proper that we request, and on our request the Board is appearing here to make public the leads that they are pursuing in this case.

I would like to call on Chairman Durfee, who is appearing at the special request of the subcommittee, to give us what inforamtion can be given at this time on leads which have some possibility or probabilities in this matter.

Chairman Durfee?

STATEMENT OF JAMES R. DURFEE, CHAIRMAN, CIVIL AERONAUTICS BOARD; ACCOMPANIED BY JAMES N. JULIANA, EXECUTIVE DIRECTOR, CAB; OSCAR BAKKE, DIRECTOR, BUREAU OF SAFETY, CAB; FRANKLIN STONE, GENERAL COUNSEL, CAB; AND EDWARD SLATTERY, INFORMATION OFFICER, BUREAU OF SAFETY, CAB

Mr. DURFEE. Mr. Chairman, and members of the committee, we are addressing ourselves in this presentation specifically to a recent accident which occurred on January 6 of this year in which a National Airlines DC–6B, operating as flight 2511 from New York to Miami, crashed about 18 miles south of Wilmington, N.C., at approximately 2:40 a.m., with fatalities of 29 passengers and 5 crew members.

Last Monday, Mr. Chairman, you will recall the Board reported on the 1959 safety record, including completed accident investigation reports. At that time we requested an executive session of the committee, and reports of 20 incompleted investigations, including this specified case.

My understanding is that we were to report tomorrow on these uncompleted investigations.

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Because of the peculiar developments in this particular investigation since Monday, we advised you, Mr. Chairman, that it might be well for us to present the facts developed thus far to the committee in executive session, and this was done this morning.

At the conclusion of our presentation in executive session, because of the unusual facts thus far developed, and the further fact that some of this information has already apparently become available to the public from other sources, the committee concluded that the public interest would best be served by disclosure of the preliminary facts which we developed this morning in open hearing.

We are therefore acting in compliance with the committee's instructions, with which, I may add, the Board concurs.

This is an unusual proceeding for the Board; because, while others may speculate and conjecture as to the facts of an accident, the cause of an accident, the primary responsibility of the Civil Aeronautics Board is to first find all the facts, then find the cause, and then report back to the Congress. This is our primary responsibility.

To our recollection—my own recollection—the only prior precedent for Board disclosure of an uncompleted investigation before an open congressional committee session was in July 1956 when the House Committee on Interstate and Foreign Commerce was investigating the Grand Canyon accident at Las Vegas, N. Mex. In that case the committee concluded that the unusual circumstances, and the wide public interest, justified this type inquiry on preliminary facts, as your committee has done today.

May I say I think we should emphasize this accident happened on January 6, just 8 days ago. In spite of the unusual difficulties in terrain, a very swampy and inaccessible area, we have had, I am advised, splendid cooperation from other agencies of the Government and from the public. We have made substantial progress, but we do wish to emphasize, Mr. Chairman, that it is a long and tedious job. All that we can report to you today is what is far from being a completed investigation of the facts.

In due course, at the conclusion of our investigation of the facts and our determination of the cause, this will be reported in full to the committee.

With that preliminary statement, Mr. Chairman, may I present to the committee the Director of the Bureau of Safety of the Civil Aeronautics Board, Mr. Oscar Bakke.

Senator MONRONEY. May I thank you, Mr. Chairman, for the preliminary statement. This testimony that we are hearing does not represent the final establishment of the probable cause, as is required by the regulations for you to find after long and careful studying of all the facts, which generally takes several months, but it is in keeping with the request of this committee in regard to uncompleted investigations. In this case, it seemed so important that we felt open testimony should be heard as to what has already been the course of the Civil Aeronautics Board investigation.

Mr. DURFEE. Yes, sir.

Senator MONRONEY. It does not represent a formal finding at law as to the probable cause, as required by your regulations.

Mr. DURFEE. That is correct.

Senator MONRONEY. Mr. Bakke, would you take the microphone?

Mr. Bakke has been previously identified as head of the Safety Division, accident investigation work of the Civil Aeronautics Board.

Mr. Bakke?

Mr. BAKKE. Mr. Chairman, the investigation conducted by the Civil Aeronautics Board was initiated on the day of the accident, immediately following notification. One of the first processes that were initiated was the establishment of the flight path and a location of the wreckage of the aircraft with respect to that flight path. It was soon determined that from a point along the North Carolina point line known as Kure Beach, to a point approximately 21 miles northwest, there was extended a distribution of parts of the National DC–6B.

The first portions that had left the aircraft in flight were distributed at Kure Beach and had been identified as portions of the forward fuselage on the right hand side of the aircraft close to the leading edge of the right wing.

Few parts of the aircraft were discovered west of Kure Beach until we reached a point approximately 18 miles and extending as far as 21 miles west-northwest from the point at which the parts from the forward righthand fuselage were located.

Within the final portions of this distribution path, by far the great majority of the aircraft wreckage had come to rest.

It was early observed that there were signs on the fuselage at the forward righthand portion of the aircraft which gave strong indication of contact with the propeller of the No. 3 engine, so that early in the investigation we were able to associate two conditions: destruction of the forward right-hand fuselage in flight, and contact of that fuselage with the No. 3 propeller.

It was also indicated that there had been an intense fire in the No. 3 engine, which ultimately resulted in the burning of the magnesium case and the very substantial fire damage to the No. 3 engine, both before impact and after.

Recognizing that the association of these two conditions proved a valuable lead to explore with respect to the possibility of contact of the propeller with the fuselage to cause the destruction of the fuselage, we very quickly focused our attention upon the No. 3 engine, found that the No. 3 propeller was still intact, attached to the No. 3 engine, and soon came to the view, so far as the programing of further investigation was concerned, that the engine damage, that the marks of contact of the propeller with the fuselge, were secondary factors and not primary factors.

This, then, returned us to the question: If the contact of the propeller with the fuselage in flight was the result of a prior breaking of the fuselage and a buffeting of the right fuselage wall with the propeller, in what condition might we usefully search for the cause of this initial fuselage failure.

The description that I have given concerning the investigation of the first 3 or 4 days, the location and preliminary examination of the No. 3 engine, was completed in its initial form the following weekend about 3 days after the accident.

During that same weekend a male passenger, one of two passengers who had not yet been located and who it had been determined had been aboard this aircraft, was discovered. He was discovered at a

point in the proximity of the fuselage wreckage which initially came from the aircraft in flight. He was the only passenger so located. All of the remaining passengers, with one exception—with one other exception—had been found, together with the main portion of the wreckage, some 18 miles—18 to 20 miles—farther west.

I might say, Mr. Chairman, that this one remaining passenger was found just a few hours ago, and his body was located approximately 1,000 yards north of the main wreckage area.

This now permits us to conclude that all of the passengers were located in the vicinity of the main wreckage area, with the exception of this one male passenger, whose body was found in the proximity of the fuselage wreckage near Kure Beach.

This one male passenger was named Julius Andrew Frank.

The association of this one male passenger with the fuselage wreckage immediately caused us to concentrate on the significance, if any, of this relationship. It was important for us to know, for instance, the condition of Mr. Frank's body. Not only was Mr. Frank's body not located together with the remainder of the bodies of the passengers, but the condition of his body was distinctly different. He bore injuries and had suffered extensive mutilation not common to the rest.

We have had the excellent cooperation of many other agencies in the investigation of all aspects of the accident, but we have been especially fortunate in having some highly expert personnel and excellent facilities made available to us in the examination of Mr. Frank's body.

As is the case with much of the investigation, it is too early to be conclusive. But we were particularly interested to note that the initial inspection of the body revealed the injuries to be unusual in many respects.

It is clear that the manner in which limbs were severed, and other such damage to the body that was sustained, was not at all similar to other injuries that can be associated with the breakup of aircraft in flight.

We noticed, also, that parts of the body had been deeply impregnated with bits and pieces of foreign material, such as pieces of steel wire, small brass articles, and other chips of wood, pieces of paint, and things of that sort, which were peculiar to this one person.

I might say that at least in some respect the chemical analysis of residual remains, which are typically made in cases of this sort, was at least in some respect complicated by the fact that the body had been submerged for 3 days and that water-soluble agents are likely to have completely disappeared.

We have been informed that Mr. Frank boarded the aircraft, having in his possession a small blue flight bag—which purportedly weighed 20 pounds at the time of boarding. Yesterday a bag resembling the bag which he was reported to have carried on board was found in the proximity of the forward righthand fuselage wreckage, not far from the location of Mr. Frank's body. The bag was severely torn, the entire bottom having been virtually torn out. There was nothing in or close to the bag that would suggest its contents.

This bag, articles of clothing, the various foreign agents that had been removed from the body, pieces of matting, rugging and lining, cabin insulation, and so on, in the vicinity of this area are all under-

going very detailed and very exacting analyses in the laboratory facilities that have been made available to us by other agencies.

Because of the possible relationship between the location of this person and the aircraft fuselage damage, certain other investigations have been initiated, and in at least one respect the Board was interested in learning that an unusual amount of insurance had been issued for this person during the preceding 9 months.

In April 1959 a $100,000 accident insurance policy was issued. In November, a $500,000 life insurance policy. Later in the same month a $100,000 accident policy was also issued. And in the following month, December, three additional policies, each in the amount of $62,500, had been issued.

Several other aspects of our investigation in this respect are currently underway, Mr. Chairman.

The perhaps most significant single aspect of the investigation is now continuing in the Wilmington area where the wreckage has been brought together in a common location, with, by the way, the splendid assistance of the Army, as well as the Marines, who made available to us the use of helicopters, without which the transport of these very heavy aircraft parts through the marshy area in which they are involved would have been very difficult indeed.

This wreckage is being reconstructed, and it is clear that the initial damage is highly localized in nature and appears to concentrate itself about the forward righthand portion of the fuselage.

I might say, Mr. Chairman, that, as well as the fuselage structure itself, there had also fallen from the aircraft, concurrently with the initial fuselage damage, portions of the aircraft interior, including a portion of a hat rack, a three-unit seat, some pillows, a man's coat, as well as, of course, the passenger who was described earlier.

The reconstruction of this wreckage is continuing.

Senator MONRONEY. Could I interrupt? For the position of the plane, you told us this morning that the No. 3 engine was the inboard right engine, did you not?

Mr. BAKKE. That is correct.

Senator MONRONEY. The propeller of this, the damage marks on the forward right fuselage were scratches?

Mr. BAKKE. Our preliminary indication would indicate this is so.

Senator MONRONEY. The position of the scratches and the No. 3 inboard engine would have been I believe you said, immediately opposite the forward lavatory in the plane?

Mr. BAKKE. That is correct.

Senator MONRONEY. I think it would be clarifying to those here to know that.

The CHAIRMAN. I was going to have you demonstrate it. That would be this engine herein?

Mr. BAKKE. That is correct.

The CHAIRMAN. What would you call the forward part of the plane? The forward right part? From how far up?

Mr. BAKKE. From midwing?

The CHAIRMAN. From the wing up to here.

Mr. BAKKE. From the wing to the No. 3 propeller.

The CHAIRMAN. What would be underneath here or around here that might cause this to happen [indicating] in this vicinity of the airplane?

Mr. BAKKE. I have no knowledge of that. This is the particular area of the aircraft which is at this moment being reconstructed, and we trust that within the next very few days it will be possible to be more definitive in such things as the location of the seat, for instance. We want to know precisely from what position did this seat derive. Similarly with respect to the rest of the fuselage.

Senator COTTON. Is there any emergency exit in that vicinity?

Mr. BAKKE. I am not prepared to answer that, Senator.

I might say so far as the emergency exit is concerned, I think with the pressurized airplanes, these open inward.

Under pressurization, at 18,000 feet, there would be a considerable internal cabin pressure which would keep these emergency exits rather firmly in place.

Mr. Chairman, as Mr. Durfee had indicated earlier in his statement, the Board makes no attempt at this time to ascribe any precise cause to the accident. I believe that especially in view of the fact that there already has found its way to the press rumors to the effect that an explosion aboard the aircraft had occurred. I believe that it would be useful to give some indication at this time that the Board has had unusually good success in locating the causes and origin of explosions aboard aircraft resulting from the use of lethal machines, and I would merely like to indicate to the committee at this time, that should there have been such a situation in this aircraft, that we believe that it will be discovered, and that the cause precisely will be established.

I say this, Mr. Chairman, not out of any wish to beat our chests, so to speak, before the committee, but rather in the attention which will likely be given this case it would be useful for the public to keep in mind the fact that our past experience has indicated that this type of condition is rather readily solvable.

Senator MONRONEY. There have been other occasions in which you have also been able—I remember the United Airlines crash in Longmont, Colo., in which you were able quickly to identify and to pinpoint this, and to make useful the other facts pertaining to it, such as the large amount of insurance carried by the person who blew up that plane for purposes of self-destruction.

Mr. BAKKE. That particular accident did not involve self-destruction.

Senator MONRONEY. That is right. He killed his mother.

Senator COTTON. Does your information indicate the age of the passenger, Mr. Frank?

Mr. BAKKE. I believe it was 32.

Senator MONRONEY. Would the insurance, which I believe you said totaled some $875,000 all told——

Mr. BAKKE. Approximately.

Senator MONRONEY. Would that be a normal or an abnormal amount of insurance that would have been carried by a person of his income status?

Mr. BAKKE. So far as our experience in accident investigation is concerned, sir, this is an unusual amount of insurance. An unusually great amount of insurance.

Senator MONRONEY. Are there any other questions?

Senator COTTON. Mr. Chairman, I do not believe we ought to ask any questions.

Senator MONRONEY. This will conclude this part.

Do you have any questions, Senator Engle?

Senator ENGLE. I want to compliment the Board on the excellent job they do on reconstructing these accidents. I have read a great many of their reports. I was amazed at the manner and effectiveness with which they can reconstruct an accident, in what to the average person would appear to be a total wreck. I assume that the actions taken here, as indicated by the testimony, are no exception. I would assume also that although we are properly cautious in stating any conclusions, you nevertheless do not neglect the plain import of what you have already seen, and that is that people ordinarily do not fly out of airplanes at 18,000 feet unless something propels them out of those airplanes, is that right?

Mr. BAKKE. Yes, sir.

Mr. ENGLE. Thank you very much.

Senator MONRONEY. Senator Magnuson?

The CHAIRMAN. I have no questions at this time.

Senator MONRONEY. As I understand again, the original disintegration of the plane on the right forward side of the fuselage, and the wreckage thereof, occurred over Kure Beach, and that the plane apparently continued for 18 or 25 miles before completely disintegrating; that the body of Mr. Frank, his blue bag, and the parts of the fuselage which left the plane at Kure Beach, were found in the proximity to that area, and then the rest of the bodies were found at about 18 or 20 miles away.

Mr. BAKKE. That is correct.

Senator MONRONEY. A plane could fly, under the conditions which you have described, as having blown out a part of the side, for that period of time before disintegrating, could it not?

Mr. BAKKE. Yes, sir, I believe so.

Senator MONRONEY. But at the speed and altitude at which it was flying, it would have been subject, with that degree of damage to the fuselage, to severe buffeting or other atmospheric turbulence that would have and possibly did cause the rest of the plane to disintegrate.

Mr. BAKKE. This is a distinct possibility.

Senator MONRONEY. There is another connection there, because some of the newspaper reports have indicated that a few of the bodies were found with life preservers on.

Is that a correct statement?

Mr. BAKKE. That is correct. Seven of the bodies.

Senator MONRONEY. In the time that it took this plane to go from the point of contact of loss of the right forward section of the fuselage, until the point of impact, there might have been time for some passenger sensing or being aware of the emergency and not knowing whether they were over water or land to have donned their life-jackets, correct?

Mr. BAKKE. That is correct.

Senator COTTON. On that point, isn't it true that, isn't it your experience, that some passengers when flying over water put on those anyway, without inflating them, and wear them within the plane?

Mr. BAKKE. That has been done, sir. My own experience is that it is very, very infrequent. I would be most surprised to find in any aircraft seven passengers having life vests on.

Senator MONRONEY. You testified, I believe, earlier, or the printed reports have been that from the last check point where the pilot reported in, he was flying at 18,000, and in rather somewhat rough but not dangerous turbulence, with light icing conditions, I believe, and that he reported in to the check points in North Carolina—Wilmington, I believe. From that time on, have you found any evidence of radio communication with the aircraft?

Mr. BAKKE. None, sir.

Senator MONRONEY. Would an explosion in that part of the aircraft, being so near to the pilot's compartment, have possibly disabled the radio equipment and prevented communication?

Mr. BAKKE. This is quite possible, sir.

Senator MONRONEY. Or that the severe damage to the plane might have rendered the plane in such a difficult position to control it that there was no chance for the pilot or the copilot to seek radio communication?

Mr. BAKKE. I think both of these are very possible. There are electrical conduits passing through this area which would be affected, both the electrical systems would be affected and there is no doubt in my mind that under this circumstance the crew would be very much occupied as well.

Senator COTTON. The bag to which you referred, carried by the passenger Frank, was that the type of canvas or cloth bag ordinarily furnished by airlines, that type of thing?

Mr. BAKKE. That is the type bag; yes, sir.

Senator MONRONEY. And it weighed 20 pounds when checked?

Mr. BAKKE. Yes, sir.

The CHAIRMAN. I did read, but for the record I think it should be in, what type of aircraft was that?

Mr. BAKKE. This was a DC–6B.

Senator MONRONEY. Under such circumstances as these, is the insurance that is carried by the passenger, if this were found to be the cause, would that insurance be valid?

Mr. BAKKE. I am afraid I cannot answer that, sir.

Senator MONRONEY. I think it would be highly important for the purpose of the record to have an answer on that at the earliest possible time.

Senator ENGLE. The courts will probably answer that.

Senator MONRONEY. Senator Thurmond, do you have any questions?

Senator THURMOND. No questions.

Senator COTTON. Mr. Chairman, I would like to add to Senator Engle's commendation of the Board. I assume, Mr. Chairman, that because of the intense interest in this case, and the rather sensational facts about it, that in executive session or otherwise, the Board will be kind enough to keep this subcommittee informed of further developments in the investigation.

Senator MONRONEY. I would like to join with my colleagues in that to express not only our high regard for the efficiency and effectiveness of not only this investigation but many of the others in searching for the probable cause.

I believe your sense of public duty when you found the circumstance so unusual as this to inform this committee of it, and then let us make the decision of such facts being made public, at least so far as they are presently ascertainable on a reliable basis as to what you have now found, is commendable.

Thank you for this special attention which you have given in this particular case, and I am sure the committee feels it is entirely justified.

If there are no further questions, we thank you for this information and appreciate your appearance here.

We will next resume our testimony in the air safety field by Mr. Tipton, president of the Air Transport Association.

(A report on developments relating to the CAB investigation of this fatal accident was given to the committee, in open session, by Chairman James R. Durfee, on February 23, 1960, and appears in a later part of this record.)

Mr. Tipton, we are happy to have you here on this occasion as you have been on so many other occasions, to give help and advice to the committee on our problems and on legislation.

You have a prepared statement, I believe.

STATEMENT OF S. G. TIPTON, PRESIDENT OF AIR TRANSPORT ASSOCIATION OF AMERICA, ACCOMPANIED BY WILLIAM B. BECKER, DIRECTOR, DEPARTMENT OF OPERATIONS AND ENGINEERING, ATA; ALLAN W. DALLAS, DIRECTOR OF ENGINEERING DIVISION, ATA; AND WALTER JENSEN, DIRECTOR, OPERATIONS, AIR NAVIGATION AND TRAFFIC CONTROL DIVISION, ATA

Mr. TIPTON. I do, Mr. Chairman.

Senator MONRONEY. Would you proceed?

Mr. TIPTON. First, Mr. Chairman and members of the committee, I want to thank you and the members of the committee, as I have in the past, for your constant constructive attention to air transportation. It has been a fine thing for our industry, and we do welcome it.

I should say that I am president of the Air Transport Association, which includes in its membership substantially all of the scheduled certificated airlines of the United States.

I am sure that the committee understands that the subject of these hearings is of the utmost importance to the managements of our member airlines. It is of the utmost importance and is the subject of the greatest attention.

The accident record in 1959 was not a good one. While the entire year's fatalities did not even approach the highway deaths during either of the recent holiday weekends, the highway record is hardly one against which we should measure our efforts. However, we must not let the results of a single year obscure the overall safety record.

The airline safety record over the years is one of which all concerned with aviation should be proud.

The 1959 accident record should be viewed in relation to the historical pattern for the industry. In that pattern there are two significant characteristics: First, the rate from year to year fluctuates, and second, the long-term trend is downward. One of the charts

which formed a part of the testimony of the CAB reveals this very clearly. It shows, for the period 1938–59 the fatality rate over 100 million passenger-miles—the generally accepted figure for indicating the safety record. You will recall that, while there were peaks and valleys in the line of the graph, the trend was downward. There is attached to my statement—and I submit it at this point for the record—a schedule which also indicates this downward trend. It shows, on a 5-year period basis for the years 1940 through 1959, the passenger fatalities per 100 million passenger-miles. The table shows a continuing decrease from a rate of 2.45 for the 5 years 1940–44, to a low of 0.50 for the period 1955–59.

This safety record is the result of the extreme care with which air transport is conducted.

This successful record is the result of hard work and continual vigilance. It results from the fact that to the extent humanly possible, everything is planned, checked and doublechecked. As a consequence, air transportation is no longer regarded as an adventure. It has reached the point where it is the prime intercity mover of passengers in the United States. In 1959, for example, the airlines carried almost 50 million intercity passengers, representing about 45 percent of the total passenger-miles operated by all forms of commercial transportation. In 1960, these figures are forecast to be: 57 million passengers and 51 percent of the total passenger-miles.

The subject of planning for aviation safety is much too big a one for me to cover adequately within the time limits of this hearing. I would, however, like to try to touch upon some of the more important aspects and elements of this important part of airline operations.

Planning for aviation safety begins long before an airline acquires any type of aircraft. Our aircraft manufacturers, generally speaking, build both military and civil aircraft, and in designing and constructing the latter they are able to draw upon the vast experience gained by them from military construction and operation. Added to this is the exhaustive research and testing that goes into every component of transport aircraft, in which effort the Federal Aviation Agency and the airlines participate. In critical areas, such as aircraft control systems and instrumentation, duplicate systems are provided to insure continued operation of the aircraft in the event of failure of one of the systems. Aircraft loads are carefully controlled and prescribed in airline operating manuals to permit, under the most critical conditions, safe takeoff and en route flight with one engine inoperative.

Before any new type aircraft or engine can be operated by an airline, it must be certificated as airworthy by the Federal Aviation Agency. This means that its design, construction, and operation must pass rigid tests supervised by that Agency. In addition, before it can be operated in scheduled service, it must satisfactorily complete proving runs, under FAA supervision, designed to fully test the aircraft on the actual routes over which it will be operated.

All of these activities are preliminary to the intensive planning and training which must be undertaken by airline maintenance and operations personnel when any new type aircraft is introduced into service. Airline maintenance experts meet with experts from the

manufacturing company and the FAA to prepare a complete program which will apply to every aircraft of that type. This program, which will eventually be reflected in the maintenance manuals of the airline, will specify in detail what inspections must be made, and when they must be made. These manuals, which must be approved by the FAA, cover each component of the aircraft and engine, and describe in the minutest detail each part making up the component, specifying the procedures and methods for its inspection, testing and overhaul.

I should add that each airline as a condition to obtaining its air carrier operating certificate, is required to obtain FAA approval of its maintenance facilities, equipment, procedures and training programs. All inspections and repairs are made under the supervision of FAA certificates airmen who must assume responsibility in writing for the satisfactory completion of the work.

While all of this activity is going on, supervisory personnel of the airline have prepared training devices—mockups or diagrams—of the operation of the many systems composing the aircraft and are conducting courses for every category of specialists employed by the airlines. Airframe specialists study every phase of the airplane structure down to the smallest rivet. Electronic specialists examine every circuit, power system, and device requiring electrical power; hydraulic specialists master the pumps, lines and systems requiring hydraulic power; engine specialists master the powerplants and their accessories. The result is that when the new aircraft are ready to come on the line, they will be met by specialists fully trained to inspect and service them.

The inspection and maintenance program of an airline is an almost incredibly comprehensive and detailed operation—all of which, as I have said, is precisely set down in the company's manuals. While I cannot take time to do more than touch upon the high points of this detailed and meticulous inspection, I believe that even the briefest summary will give the committee a feeling of the thoroughness and completeness of this operation.

On a typical airline, the aircraft receives—

1. A daily inspection of the areas of primary importance to flyability, such as certain engine features, control surfaces, primary structures and components, control systems, and instrumentation.

2. After each 75 hours of operation, the aircraft receives a more comprehensive inspection during which areas are opened up for minute examination. This inspection includes many components and accessories of the powerplant and other components and systems within the aircraft which the experience of the FAA, the manufacturer and the airline indicates might be subject to wear or deterioration within this number of hours.

3. After each 250 hours of operation, a still more comprehensive inspection is made in which still more areas are opened and items are checked and serviced, if necessary, in accordance with a planned procedure.

4. After each 2,500 hours of operation, an even more detailed examination is made principally of the larger items and components, such as wing sections and spars, which experience indi-

cates may begin to show signs of wear or deterioration after this length of time.

These repetitive periodic inspections, usually referred to as progressive maintenance, are designed to insure continuous airworthiness. They continue to be made as long as the aircraft is in service.

In their course, important components and accessories are, at times prescribed by FAA regulations, removed from the aircraft and sent to maintenance shops for complete overhaul. This overhaul consists of complete disassembly, replacement of worn parts, reassembly, and careful testing.

The component is then literally as good as new. Thereafter it is ready for another cycle of use. Generally speaking, these overhaul cycles begin at approximately 1,000 hours in the case of certain components, such as engines, and extend to longer cycles of time in the case of others not as subject to deterioration or wear. These prescribed overhaul periods are constantly under review by the FAA and the airlines and are changed as experience indicates.

In its inspection and overhaul program, the industry, of course, makes use of the most modern inspection, testing, and maintenance equipment available.

In addition to this comprehensive program, other precautions are taken to correct airplane defects as they occur. If a defect occurs during a particular flight, it is recorded on the flight logbook and corrective measures are quickly applied.

Furthermore, serious defects encountered in an airplanes' operations are made known to all other operators on an industrywide basis by means of an FAA daily report, which is immediately distributed by the ATA to all its members.

Thus other airlines can quickly apply preventative corrective measures to prevent similar defects in their own equipment. Based on these reports and other information, inspections or modifications of the aircraft part or component involved are frequently prescribed by the FAA, applying to all operators of the same equipment, to prevent reoccurrence of the problem.

I should say at this point, Mr. Chairman that on reviewing these extensive activities in the airline industry to maintain their equipment in an airworthy position, it occurred to me to inquire the amount of expense incurred by the air transport industry in their maintenance operations, in their maintenance of flight equipment.

I found that in the fiscal year ending June 30, 1959, the air transport industry had spent $450 million on maintenance of flight equipment. That constitutes something over 25 percent of the total $1,600 million of air transport industry expense during that same period.

I believe that tends to dramatize the emphasis placed in the air transport industry on the maintenance of the equipment.

This intensive activity in the airline's engineering and maintenance department is matched by the operations department. The flight crews which will operate the new aircraft begin their training with a ground indoctrination course which, typically, consists of 90 hours of classroom time and many more hours of homework.

The crew becomes thoroughly familiar with the construction and operation of the complex systems which make up a modern aircraft. After the paperwork has been mastered, it is followed by intensive

training in the aircraft, including takeoffs and landings, during day and night, normal and emergency flight maneuvers, and flight under simulated instrument flight conditions. The crew is almost ready.

Before the pilots commence service in scheduled operations, they are given a check flight in the aircraft, under the supervision of a company check pilot or an FAA inspector, to determine whether their proficiency meets the high standards of the airline and the FAA.

Before going to command duty, the flight captain makes a check flight as captain, with a check captain riding as monitor. Only then is the captain qualified to take command of the type of aircraft on which this checkout procedure has been completed.

The operations personnel who perform their planning, servicing, and monitoring operations on the ground have, in the meanwhile, also been undergoing intensive training. Qualified company instructors have conducted classes for flight dispatchers in aircraft systems, flight planning, cruise control, meteorology, and other related subjects.

Ground personnel who will service the aircraft at the ramp have been instructed as to the procedures to be followed in fueling, loading and ramp handling the aircraft. For some of this training company instructors travel from station to station to perfect personnel along the system in the techniques to be followed. In other classes company instructors teach cabin personnel their duties and responsibilities for the safety and comfort of the passengers.

I have described this training primarily from the viewpoint of the initial training of personnel. The fact is that these training programs are continuous. Periodically, these specialists are back in school for refresher courses, to learn new techniques and methods.

An airline never sleeps. A ticket office may be closed at night, but operations and maintenance work and plan around the clock. Long before a flight crew leaves home for the ride to the airport, company operations technicians are analyzing the route weather for each airport, and the weather aloft.

Hundreds of weather reports from ground stations and from aircraft are culled to determine whether there is any weather condition—wind, precipitation, turbulence, and so forth—that might have an effect on the safety and comfort of the flight.

Reports of field conditions at each airport are assembled. FAA notices regarding the servicability of air navigational aids are studied to make sure that all en route aids are in operative condition.

In the maintenance department, after the checks I referred to above have been made by FAA certificated mechanics under the supervision of maintenance inspectors, the aircraft is "signed off" as airworthy and delivered to the airport terminal. It is almost ready for flight.

In the operations office the preliminary program for the operation of the flight is prepared in compliance with the rigorous standards of the FAA and the airline. At this point, the flight dispatcher, a highly trained flight operations specialist, certificated by the FAA, makes a preliminary decision as to whether or not the flight will be operated. His decision is based on all of the many factors which may affect the flight.

The flight crew arrives and the check on checks really starts. On aircraft requiring a flight engineer, he proceeds to the aircraft and begins his doublecheck of the maintenance department. Up in the

operations office, the captain and the first officer check the flight plan with the dispatcher.

Adjustments may be made to the fuel load, another alternate airport may be selected, the flight altitude may be modified—if safety requirements dictate. Particular attention is paid to compliance with the strict requirements of the airline's operating manual relative to the amount of payload which may be carried, taking into consideration all of the operating factors existing at the time of the flight.

The plan cannot be finalized unless both the dispatcher and the captain are completely satisfied with it and are willing to take responsibility for it by signing it. Here again there is a doublecheck—the plan must be approved both by the man on the ground and the man in the air.

After the plan is finally approved, it is sent to the FAA air traffic control center and the captain and the first officer proceed to the aircraft.

With the flight crew at their stations, the check on check procedure continues. In a typical 4-engine aircraft, before engines are started, 80 additional separate items, such as controls and instruments, are inspected to insure that they are functioning properly.

During every step of these checks, the crew member making the check does so under the supervision of another member of the crew. Now the team is ready to commence the "starting engines" procedure and the remaining procedures which lead to the beginning of the flight. In flight the vigil continues. In the air or on the ground, the monitoring is never ending—check and doublecheck, anticipate problems, dispose of them.

Despite the incredibly comprehensive and meticulous planning, monitoring, inspecting, checking and doublechecking which I have referred to, accidents do happen.

As the committee knows, an aircraft accident is a serious thing, but even the accident is made to serve the interests of safety. It triggers tremendous investigative activity by the CAB, the FAA, the airline, the aircraft and engine manufacturer, and other interested organizations. Every resource at the command of these organizations is used to determine what caused the accident, and to prevent a recurrence.

Without overlooking the important part played by other agencies and groups, I would like to mention specifically what a splendid job the CAB has done in conducting these investigations.

The airlines are proud of their maintenance and operating procedures and safeguards. We are convinced that these programs are sound and are properly carried out. We do not believe any important element is missing or is wrong. If either were the case, immediate action would be taken to correct the situation.

To date, it is generally agreed that the accidents which occurred in 1959 do not fall into a pattern, even with respect to such elementary considerations as the point on the flight at which the accident occurred, the type of aircraft involved, the airline involved, the weather conditions or the time of day.

In the absence of any such pattern, the airlines cannot concentrate on any one area for collective action. Their program must cover the entire operation. Consequently, they are maintaining the high

standards which govern airline maintenance and operations, and are making every effort to intensify, wherever that is possible, the planning, inspection, monitoring, checking, and doublechecking done in connection with those functions.

There is no need for additional legislation. The Federal Aviation Act of 1958 was soundly conceived and should be continued in its present form.

The Federal Aviation Act grew out of the overwhelming public need for an independent Federal Agency with adequate authority to control the use of the airspace by both military and civil aviation and to provide for a common system of air navigation and air traffic control.

In June of 1958 I appeared before this committee on behalf of the airlines and endorsed the establishment of an independent Federal Aviation Agency, which would have the character of a civil-military organization. I pointed out that the industry favored this action because it wanted a strong, dynamic Government agency to provide the air traffic control, navigation aids, and the research and development needed to move efficiently and safely the increasing amounts of air traffic.

Although the Civil Aeronautics Act of 1938 provided a reasonably effective basis for aviation safety regulation and airway management at the time of its passage, the authority and responsibility for doing this soon became diffused and divided among various agencies and numerous committees.

This development, coupled with the tremendous increase and technological improvement in air transportation, resulted in a clear recognition of the need for centralized authority in these vital fields to insure the safety and efficiency of all aircraft operations. For those reasons, the industry fully endorsed the bill (S. 3880) which became, in the 85th Congress, the Federal Aviation Act of 1958.

The Federal Aviation Act has been in effect 1 year.

The independent Agency which it created has been constructive, aggressive, fast moving and firm. It has to its credit solid achievements in the fields of air navigation and traffic control, air space management, and research and development.

In the field of air navigation and traffic control, it has made substantial progress in the integration of military and civil air traffic under the control of the FAA. It is operating or is assisting in the operation of a substantial number of military air navigation and traffic control facilities, particularly radar approach control systems (rapcons) and military surveillance radar installations for long-range air traffic control.

In many cases, these facilities are being used for the control of both civil and military traffic. It has installed, tested, and put into operation a substantial number of: control towers, VORTAC facilities; long-range radar facilities; and radar beacon equipment, which will improve the operation of radar facilities.

Further in the air navigation and air traffic control field, the FAA has done an outstanding job in establishing routes for turbojet aircraft. Since these aircraft, once they were available, were introduced into airline operations rather rapidly, the FAA had to move with great speed and efficiency to provide the routes and air navigational

facilities, principally long-range radar, which these aircraft require. the FAA met this challenge. Because of the speed and efficiency with which it moved and the successful cooperation it obtained from the military establishment, these routes were ready and the necessary radar facilities were manned, when the jets were ready. For this the industry is deeply grateful to General Quesada and his staff and to the participating military establishments.

In the field of airspace management, the FAA also has solid achievements to its credit. This committee will recall the presentation the airlines made to it several years ago regarding the severity of the problems arising from the establishment of military restricted areas and warning areas, particularly in coastal regions.

One of the reasons for the creation of the FAA was to confer upon it sole jurisdiction over these matters so that the vanishing airspace would be used in a manner best serving the interests of the public and the national defense. The FAA has borne down hard on this problem. By requiring a clear justification for airspace reservations, it has halted the rapid preemption of the airspace by the military and has begun reducing the size of these reservations.

During 1959, the FAA initiated a plan for the complete revision of the intermediate altitude airways structure (15,000 to 23,000 feet) designed to provide more direct airways and thus produce a more efficient route structure.

In the field of research and development the FAA has undertaken a broad program for the improvement of the air traffic control system. A number of contracts have been let to research organizations, which have made progress on them.

The overall program calls for vigorous research and development efforts in the areas of: better radar and better direction finding techniques for the acquisition of air traffic control data; the provison of data processing equipment for faster use of these data; the development of automatic communications facilities between air and ground and between ground stations, to supplement voice communications; improvements to the VOR system and the development of better techniques for using VOR; the development of long-distance navigation systems; and, finally, the development of an effective collision avoidance system.

Obviously this broad program will require time and money; the benefits will not be achieved for some time. The important thing is that the FAA has made an excellent start.

Also in this area, the FAA has initiated a program of coordination with foreign governments. In addition to frequent technical consultations, this program includes the testing and evaluation of systems, facilities, and techniques developed in foreign countries, and is vital to securing international agreement on future air traffic control and air navigation systems.

There is need for an improvement in the manner in which the FAA handles the preparation of safety rules. This can be accomplished without statutory change.

It is, I suppose, inevitable that when a regulatory agency as strong and vigorous as the FAA goes into action, those it regulates will not always agree with the decisions it makes or the procedures followed in making them. The FAA does not appear to be an exception. While

the airlines recognize the splendid overall job which the FAA has done, they do not agree with the manner in which the FAA performs the important function of preparing and issuing safety regulations.

Under the Federal Aviation Act, this important function was transferred from the CAB to the FAA. This was part of the process of consolidating in one agency all policy determinations with respect to aviation, other than purely economic regulation. The airline industry believed, and still believes, that the transfer of this important function to one agency was a good thing.

However, the solution of a problem in the filed of airline safety regulation requires a full and free discussion and exchange of information on an informal basis, between the FAA and the industry, regarding it.

The FAA cannot be expected to be intimately familiar with all of the different operating, engineering, maintenance, and communications problems the airlines face daily and hourly.

Knowledge of these problems and the effect of the proposed regulation can be obtained only by discussion with those whom the rule will affect. The procedure now being followed by the FAA does not provide for this full and free discussion.

At present the FAA prepares a draft regulation and publishes it in the Federal Register as a notice of proposed rulemaking under the Administrative Procedure Act. Many such proposed rules are issued without a proper attempt being made to find out what effect on the industry the proposal will have.

After the proposed rule is published the airlines are permitted to file written comments on it and, in some cases, to make oral presentations to the FAA. There is nothing wrong with the Administrative Procedure Act, but bare compliance with its procedural requirements is woefully inadequate in the field of safety regulation to produce the free exchange of ideas and information between the industry and the FAA that is vital to sound regulation. To the extent that there is an exchange of information, it is stilted and difficult.

In the field of safety regulation, it is vital that a considerable amount of spadework be done before the formal procedures prescribed in the Administrative Procedure Act come into operation.

Prior to the issuance of a notice of proposed rulemaking, the FAA should confer informally with the airlines, and others concerned, to get a better understanding of the nature and posture of the problem—indeed, whether a problem actually exists; possible methods of solution; and the direct and indirect effect of various solutions.

Unless this is done, it is likely that the rule will not be a good one. It may even create safety problems.

Among the benefits which would result from a free flow of information on safety rules would be a pointing up of the need for special consideration of international rules as compared with domestic rules, because of the existence in the international field of problems and considerations not found in the domestic.

It is important to note that the change we recommend in the rulemaking procedure does not require any amendment to the Federal Aviation Act. It can be accomplished merely by internal action by the Federal Aviation Agency.

To strengthen the industry's efforts in the field of safety, continued progress on Federal programs in air traffic control is vital.

The airline industry recognizes its responsibility to the public for safe operations. Previously, I outlined our efforts to meet that responsibility. These efforts would be supported and strengthened by continued progress on certain governmental programs, which should move forward as comprehensively and as rapidly as budgetary limitations permit. These programs relate to the following two major areas:

(a) A program to provide an even better system of Federal airways and more efficient and comprehensive air traffic control capability on these airways in accordance with the development programs already in being. This program involves the following facilities and services:

(1) Additional airways to match the expanding range of air transport services. This entails the provision of more airways and the establishment of more controlled airspace so that aircraft will be under the surveillance of the air traffic control system more of the time.

(2) The long-range radar program should be expedited to provide more complete national coverage, with first emphasis on those areas in which no coverage now exists.

(3) The implementation of the standard short distance navigation aids should be expedited and expanded to provide full coverage and to eliminate, where possible, the need to use older and more cumbersome navigation aids. Efforts should be made to provide the greatest possible accuracy and flexibility.

(4) Better and more current meteorological information, and improved communications facilities to disseminate this information, are needed.

(5) The provision of improved air-ground communications should be expedited and the project expanded. The FAA project for the provision of direct oral communication between the pilot and the air traffic controller should be completed. Currently this provides for a coverage of the majority of the Federal airways. The direct communication program should be completed as rapidly as possible to provide air-ground communication coverage of all navigable airspace at the earliest practicable date. The FAA project for the development, evaluation and introduction of semiautomatic and eventually fully automatic air-ground communications should be fully integrated into the rest of the ATC system improvement program.

(6) Minimum standards of operation should be applied to all users of the airspace. All of the development and implementation projects can and must take into account not only airline and military aircraft of all categories, but also the business aircraft and the mass of smaller general aviation aircraft. An immediate step, we believe, should be the application of minimum performance standards for navigation and communications equipment to all aircraft users, both military and civil, rather than to the airline user alone. It is hard to believe, although it is true, that aircraft other than airline aircraft are permitted to use communication and navigation equipment that conforms to no stated FAA minimum standards.

(7) The imposition of positive control of the airspace must be expedited. This project can provide one of the major contributions to collision prevention.

(b) A program to secure more precise navigational guidance and traffic control of aircraft flying near airports, as well as landing and taking off. This program should be expedited and should include the following facilities and requirements:

(1) The establishment of control zones at all airports which are provided with instrument approach procedures.

(2) The establishment of control towers at all airline airports.

(3) The installation of runway lights at all airports.

(4) The installation of instrument landing systems, either single or multiple, as the situation indicates.

(5) The installation of visual glide path equipment.

Mr. Chairman, this concludes my testimony on the subject before the committee today. We will, of course, testify on the other subjects on the committee's agenda when those subjects are heard.

(Table of passenger fatality rates follows:)

Passenger fatality rates, U.S. scheduled airlines,[1] 1940–59

5 years	Passenger fatalities	Revenue passenger miles (millions)	Rate—Fatalities per 100 million passenger miles
1940–44	224	9,136	2.45
1945–49	623	36,693	1.70
1950–54	561	80,951	.69
1955–59	773	[2] 155,445	.50

[1] Alaskan carriers included beginning in 1953.
[2] Passenger-miles for 1959 estimated on basis of data for nine months.

Source: Civil Aeronautics Board, U.S. air carrier and general aviation accidents, Statistical Review, calendar year 1958, and predecessor annual accident publications.

Senator MONRONEY. Thank you very much, Mr. Tipton.

I note your reference to safety rulemaking. I wonder if you have any specific rule that had been made in a way which you feel could have been helped had the prerulemaking conference, informal conferences which you suggest, had they been held.

Mr. TIPTON. Before answering, or asking Mr. Becker to answer that, I should introduce the gentlemen at the table.

On my right is Mr. William Becker, director of operations and engineering of the ATA; on my left is Walter Jensen, who is director of operations.

On Mr. Becker's right is Mr. Allan W. Dallas, director of engineering and maintenance.

If I may, I would ask Mr. Becker to answer the question you just put.

Mr. BECKER. Mr. Chairman, some proposed rules which have come out within the past 6 months and then were adopted, on which there were no preliminary discussions that we know of prior to being set forth. One is on mandatory airborne radar. Another is the carriage of cargo in passenger compartments. Another was the copilot proficiency checks. And a fourth one is the approval of all radio or radar equipment by T–50 for type certification.

Two of those regulations have now become effective regulations. The one on mandatory airborne radar and the one on copilot proficiency checks.

There has been, as the result of the draft release in both of those cases, considerable discussion with the FAA, as we stated in our direct testimony here, in a rather stilted and informal area. There was no opportunity to, you might say, let your hair down and discuss these things to find out what the basic problem is, if there was a problem.

We have recently had, one that disturbs us considerably, not even a draft regulation. It was rather a letter sent out from the FAA office to the various regional offices with respect to the way you should operate aircraft with slush conditions on the runway and water standing on the runway, which is in effect a regulation, but it did not go through the regulatory processes.

I only know of two airlines that have been informed of it, and both of them in a different manner, so the regulation is not being applied uniformly. This is not the way it should be done, I don't think. The opportunity to discuss the problem, in view of the fact that some of the airlines had been operating that particular piece of equipment for well over a year in the wintertime and under airports where considerable water was standing.

Senator MONRONEY. There were very few jets operating last winter. There are quite a few operating this winter. I think there was only one airline that had jets last winter.

Now you must have 10 which have jets.

Mr. BECKER. That is right.

Senator MONRONEY. I imagine the landings and takeoffs would be multipled by many times 10.

Mr. BECKER. There were about three, I believe, Senator, in the latter part of the winter that were operating in the northern climate.

Senator MONRONEY. Those are the specifics that you had in mind?

Mr. BECKER. That is the type of thing.

Senator MONRONEY. Your suggestions in that degree follow fairly well the route, though you are not always sympathetic with their views, of the Air Line Pilots Associations. They register the same complaint and seem to feel that there has not been consultation or prediscussion prior to the writing and firming up of regulations, therefore, you must overcome by affirmative testimony or conversation that which has already been rather firmed up as a policy of the FAA.

Is that the correct interpretation of your attitude?

Mr. TIPTON. May I give a further illustration—and it is this: We had one of these meetings under the Administrative Procedure Act the other day, and I attended it.

Presiding over it was Dave Thomas, probably one of the best air travel control men in the country.

With the air travel control group were these gentlemen sitting with me plus a number of airlines operations men, all concentrating on a common problem. The problem was to solve it. It was not anything else. There was no conflict in interests in this group.

Nevertheless, by reason of the restrictions of the Administrative Procedure Act, a good part of that meeting was spent in debating between the FAA lawyer and myself. I enjoyed that, and I am sure he did, too.

Senator MONRONEY. Was it unlimited debate?

Mr. TIPTON. To the extent that we could make it, it was. That is not a good way to solve safety problems. These are roundtable problems mostly, in which you hammer them out best, not by legal procedures but by the application to them of the best brains everybody can muster.

Fortunately the FAA has very good brains on their staff, the airlines have very good brains on theirs. If you can put them together, with all due respect to my profession, without permitting the lawyers to enjoy themselves so much, it is a better way of doing it.

Senator MONRONEY. I am sorry but we have a live quorum going on. I will ask that the subcommittee stand in recess for about 15 or 20 minutes.

(Short recess.)

Senator MONRONEY. The subcommittee will rapidly resume its sitting. I don't know when the bells will ring. I would like to finish up as rapidly as we could at this point because we are going on amendments over on the Senate floor.

Summarizing what you have said, would you not say, Mr. Tipton, that in order to avoid the long, cumbersome, and bureaucratic dilatory tactics with which aviation rule changes and action so necessary to aviation safety have been tied up, that there is some feeling on the part of the industry, both pilots and yourselves—private pilots as well—that perhaps these changes now are being done without quite enough consultation before the fact and without adequate opportunity to be heard or get the industry's views before they are firmed up within the Agency?

Mr. TIPTON. That is exactly right. I want to emphasize the fact that of course the regulations are never issued without giving the industry an opportunity to be heard under the Administrative Procedure Act.

But that is a formalized sort of thing and is not as satisfactory as the more informal conference-type method of doing that. I think the FAA could improve its already very good performance by instituting that kind of a procedure.

Senator MONRONEY. We are going to get into this stronger when we hear the 60-year limitation on pilots and the medical requirements for certification of pilots.

I hope we can go into it more fully at that time. This is on air safety primarily. I compliment you on your statement detailing the various matters as to the great care that goes into making a plane flight ready, in being sure it is properly maintained and ready when it comes to the runway.

We have had testimony in one or two of these accidents that would indicate to the committee that there should perhaps be a little more care in transition of veteran pilots with thousands upon thousands of hours in reciprocating engines, before being placed on an entirely new type of aircraft, aircraft that do not give the necessary warnings by the sound of reciprocating engines when the attitude of the plane is changed, new instrumentation, new valves, new buttons, new gadgets to push and twist and to check out on. That in some cases the transition has been rather brief on certain types of planes.

In spite of what you say regarding the training program, we are disturbed, particularly in one accident case, as to airline activities in

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In spite of what you say regarding the training program, we are disturbed, particularly in one accident case, as to airline activities in

this matter, the American Airline wreck of the Lockheed Electra at LaGuardia, where there evidently was confusion because of new instrumentation.

It could easily be due to the similarity in appearance between the old altimeter and the new one. Yet, from a quick look at it, it could very easily be misread at a point of crisis. We brought out that had the airport been properly equipped with instrument landing facilities, with an approach radar, or even better yet, with high intensity approach lighting, that that would have forgiven the mistakes of the pilot.

So it is not all the blame. But this particular pilot had been cleared after some 28 hours by a company waiver of the 100-foot extra ceiling that was required. The American Airlines' regional superintendent of flying authorized the removal of the extra 100-foot restrictions after 12½ hours—12 hours and 32 minutes of experience on this new aircraft.

This was a safety margin, and I think wisely has been written into the air safety regulations, yet he was cleared to go in, a good pilot though he was, but he was in a strange aircraft.

And this landing was being made when he had 49.13 hours in the Electra. I presume that we learn from mistakes, and that probably greater attention is being given to transition, particularly to the waiver of rules requiring proper time of transition.

Mr. TIPTON. The matter of transition training in this period we are going through, the institution of a large amount of new equipment, of course, has been concentrated on not merely since we got the equipment but for a number of years before that, and the training programs laid out.

An extensive discussion of the transition training and how it exactly was done is much too long to spell out here except to say that it is done also with this meticulous care that I described.

Senator MONRONEY. I noted that you have emphasized the days of schooling, the nightwork, the simulators. But there is no substitute for cockpit experience, and there is no substitute for flying that plane in weather. And this plane was being flown on a very marginal ceiling.

Though he was qualified and checked out on experience he was still coming in on a marginal experience because only three readings had been above 350 feet and two had been below 350 feet, and the minimums for that dark and very poor approach to the LaGuardia field, with a very short runway, which greater airport funds might have extended, would indicate that at best it was very marginal, and the experience of flying the plane in weather itself, and under the tenseness of cockpit conditions on making approaches to difficult situations, would, I think, have given this pilot the confidence that he might have needed.

The fact that he was flying almost to a landing with the autopilot on would indicate, and the testimony so indicated from the CAB, that he lacked the confidence in himself in the operation of that aircraft.

Mr. TIPTON. I don't think there can be any doubt, Senator, that the actual operation of an aircraft in schedule is surely the final test after the classroom training, the simulator training of the actual check training that goes on in the aircraft before he flys it.

There can be no doubt of that.

Would you like to comment on transition training further?

Mr. BECKER. I would like to comment if I might on this particular point, about eliminating that additional 100-foot requirement for a ceiling.

We have discussed this matter with the FAA on about three occasions now since that accident. There were discussions along the line that we should make it an across the board requirement that when you are transitioning to a new airplane you add a 100-foot ceiling.

The general thinking was that this is the right figure for some airplanes, but if the pilot was coming into a DC–3 this would not necessarily be the right figure; it may be 50 hours, because he is going to operate on short stages and will make a greater number of landings and takeoffs.

Senator MONRONEY. I agree with you there. In the same number of hours he would have had more skill than a man making only one landing for the full duration of his flight.

Mr. BECKER. Our only concern was that it shouldn't be made across the board. It should be approached on an airplane-by-airplane basis. For example, with a helicopter it wouldn't make sense to do it in 100 hours, because that helicopter is landing every 7 minutes.

Senator MONRONEY. Certainly you would not feel it bad policy if greater care were taken as to the checking out of the pilots for their own safety. No matter how competent a man is in one type of airplane even with a greater degree of competence it may be more difficult to teach him to fly a new type of aircraft because he had become so accustomed to the old.

Mr. BECKER. Not only do we agree with you but the airlines do.

Senator MONRONEY. Do you know whether or not the airlines have suspended this waiver or not?

Mr. BECKER. No.

To answer your question specifically; no. But I understand that on the jets it is running about 80 hours now before they let a man go, and even on the F–27 it is running 75 hours, in that area. It is not 100 hours, but it isn't down further.

Senator MONRONEY. I spoke earlier, and I am glad that you hit it very strongly, too, on the need for improvement of navigational aids at or near airports. While you speak and approve and encourage the speed of the long-range flight aids and safety aids, you were very strong in your language and I quite agree in program B, on page 19, where you underscore the needs for more precise navigational guidance and aircraft, underscore flying near airports as well as underscore landing and taking off. What would you say was your highest degree of priority for air safety in this area which does, as I think most people who fly a good deal consider the landing as probably one of their greatest exposures to danger in aircraft?

Mr. TIPTON. I would like to ask Mr. Jensen to comment on that, Senator.

Mr. JENSEN. I may be somewhat prejudiced in joining you, Senator Monroney, in support of the visual aids as probably being the first thing to come to mind in answer to your question. I say somewhat prejudiced because I have done some work in this field myself and

also as a pilot I know the value of these aids. I have heard your comments previously during this hearing.

I think you will recall that we have, as an industry, supported your fine efforts in this regard for a number of years.

In quick response, I would say visual aids in general around the airport would come high on that list.

Senator MONRONEY. This is simple; this is cheap; this can be done. We don't have to wait 2 years, as we do on approach radar and things of that kind. But anybody can knock out in mass production high-intensity lighting systems and install them rather rapidly. Excepting for certain geographic positions, such as this back approach to runway 22 at La Guardia, where you have navigable waters, most of these areas can be had, if we are determined to go after them.

I found in rechecking the law that instead of requiring the cities to pay 25 percent of this approach lighting, these are considered Federal navigational aids and they qualify for a 100 percent Federal contribution, and all the lazy airport authorities or the dilatory city commissioners have to do is to supply the right-of-way.

This, to my way of thinking, is one of the worst lags and one of the most inexcusable hazards to safe flying that we have in America today. I don't know why we can't break as simple a bottleneck as this with some determined action, and even authority, which if the FAA does not have, the Congress will be happy to give to them so as to require this to be done with all possible speed.

The other lighting features, runways, are important. There is a new lighting development to eliminate that dark hole on the first part of the runway which you have seen in operation at Washington National. I doubt if many others have been installed.

While I am happy that the FAA is studying and developing more modern lighting, I don't think with air traffic at its present point and with airports more crowded than ever that we need to wait for the last and ultimate development before we get busy and put these in. By the time we get around to replacing the ones that go in now with more modern ones, we will have saved a great many lives and above that prevent the exposure of additional millions of people to dangers to which they do not need to be exposed.

I want to compliment you on your support of this and assure you that this committee will do everything possible to speed it up.

You were here when the testimony of Mr. Bakke was given on this unusual situation that caused the loss of that National Airlines plane in North Carolina, were you not?

Mr. TIPTON. Yes.

Senator MONRONEY. Do you know how many accidents have occurred in which there has been an explosion of a bomb carried aboard during the life of civil aviation?

Mr. TIPTON. I can state my own experience going back over 20 years. I can recall in this country and aboard four such accidents. When the Civil Aeronautics Board identified this as an accident so extraordinary as to require them to break their rule of not commenting before their investigation was complete that they were surely right. It is most unusual and, of course, as all accidents, it is tragic.

Senator MONRONEY. There were three in the United States, two fatal and one nonfatal. One occurred out of Las Vegas in a Convair, which blew up the lavatory compartment by an explosion. One occurred in the United plane where the bomb was placed aboard, where the person had insured his mother who was a passenger on the plane. And this is the third in the United States. I think there was one in Canada.

You mentioned there had been 50 million intercity passengers carried in 1959 alone?

Mr. TIPTON. That is right.

Senator MONRONEY. You can carry that back to the history of air transportation and it would probably run up to the hundreds of millions of passengers that have flown. And this is the third such accident in the history of civil aviation in the United States.

Mr. TIPTON. That is right.

Senator MONRONEY. I know that these are exceptional, they are extreme, and I know that thought has been given by the ATA and the airlines to search for means whereby such cases as this might be at least subject to some kind of checking as the baggage is brought aboard the plane. Has there been any study made by the ATA in this direction?

Mr. TIPTON. As you know, we have been plagued in the past with false alarms.

Senator MONRONEY. This has been a very bad situation.

Mr. TIPTON. Congress has acted very promptly and very severely in that area, both with respect to the actual placing of explosives on board an airplane and the giving of false alarms.

There has been a great deal of study on the question of detection here. At the time I cannot report a solution, but it will, of course, remain a very active subject of study in our industry.

Senator MONRONEY. There are devices available, are there not, which would X-ray baggage, which would indicate whether there was the presence of metal or other things that might be required in the identification of an explosive device carried within baggage, that would reveal, as the baggage is passed through the loading ramp, whether there is any such material involved?

Mr. TIPTON. That I can't answer.

Can you answer that?

Mr. BECKER. I think we can help partially. There have been several suggestions along that line. The difficulties are that most passengers carry something that is metallic in nature, generally an alarm clock or some sort of clock which sometimes is associated with a bomb.

Then we have had the thought, the concern, rather, of ruining some of the passengers' equipment that he carries if it is exposed to that type of X-ray, which would explode or deteriorate or be of little value.

But to answer your question specifically, there are these things. The question is how you can make it work without having to almost open everybody's baggage after you found out there is something metallic in it.

Senator MONRONEY. If you had the power and the right—I do not know whether you have or not under the law—to open any bag for inspection where the circumstances surrounding the matter were in

any way suspicious without reference to the passenger smuggling aboard explosives, but merely for proper inspection, if the public knew of that, would there not be less likelihood that they would feel free to carry it aboard?

For example, apparently this attorney was carrying a Pan-Am bag which normally would contain toilet articles and little else, and be so light that it is rarely weighed.

In this case it was 20 pounds, apparently as it was checked in, and would indicate certainly something more than the normal amount of materials ordinarily carried in that way.

Mr. TIPTON. The comment on that is: I would not have any doubt as to the right of the airline that proposes to transport baggage to open and examine that baggage if they have reason to believe that there were dangerous materials in the baggage.

As you know, in the case where we have gotten these false alarms, the baggage has been withdrawn from the aircraft, opened and examined.

We have not had our right to do that challenged. And if there is any reason to believe that any such material is in there, we would not, I am sure, hesitate.

Actually, we would not hesitate whether we had the right or not to open the baggage and look.

Senator MONRONEY. The statistical result is fantastically rare, and I am not speaking for the nervous old ladies who have never flown or who are making their first trip.

But I have found more airline pilots who are concerned with this thing than with anything else. Not with anything else, but it is a major problem in their lives.

I have talked with hundreds of them, in flight and otherwise, and they have absolute confidence in themselves, their ability to fly through turbulent weather and bring the plane safely in. They have confidence in their machine and the condition in which it is turned over to them and in navigational aids and even with the congested air traffic.

But this is one unknown that is beyond them, and it does arouse in some people's minds, and I am sure that air traffic results will show it tomorrow, that this is the one in 10 or 20 or 30 million cases where it could happen.

Mr. TIPTON. I think that that point is extremely well taken, because the pilots of the airlines, and the airlines themselves, have created a tremendous public confidence in the airlines' and the pilots' ability to operate the airplane. They show their confidence by 50 million of them riding last year. That confidence has been rightly developed.

But clearly a passenger would view this hazard as one that goes beyond air confidence in the airline. And I think that should be pointed out, the thing that we started with, and that the chance of having that happen is one in a million—many million.

Senator MONRONEY. One in fifty million or more than that. Because there were 50 million last year. And you multiply that since the Civil Aeronautics Act of 1938, and I do not know how many hundred million you would get. You would get probably into

half a billion passengers carried. That is not passenger air-miles; that is passengers.

Mr. TIPTON. The chance of that happening is surely less than the possibility of having a building stone fall off a building on your head.

Senator MONRONEY. As I consider it, having flown a great deal myself, I am so glad to know that it was not a structural failure, that it was not pilot error, it was not the failure of navigation, and it was not rough weather. These are things that are within the ken and the normal operating hazards of aircraft. But this comes in the nether-nether lands of stratospheric computation as to probabilities of risk.

It still is hard to make the public understand, with its rarity, how little normal genuine risk it involves because of its spectacular effect in its publicity.

If you have any further suggestions, any study being made on this, to maybe ease some of the minds of the people as to what might be done, we will be glad to hear them at a later time.

Do you have any further suggestions that you would care to make at this time, Mr. Tipton?

Mr. TIPTON. We have nothing to add to our testimony as far as this part of the hearing is concerned, Senator. We will of course participate in various parts of this hearing as it goes along.

Senator MONRONEY. We appreciate that. Because of the situation in the Senate—we are voting on a clean election bill—I believe it would be propitious to recess the hearings at this time.

The first witness tomorrow will be Mr. William K. Lawton, the executive director of the National Business Aircraft Association, Washington, D.C.

You don't want to be heard this afternoon, do you, Mr. Lawton?

Mr. LAWTON. No, sir.

Senator MONRONEY. We stand in recess until 10 o'clock tomorrow morning.

(Whereupon, at 5:06 p.m., the committee was adjourned, to reconvene at 10 a.m., Friday, January 15, 1960.)

REVIEW OF THE FEDERAL AVIATION ACT

(Air Safety)

FRIDAY, JANUARY 15, 1960

U.S. SENATE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
SUBCOMMITTEE ON AVIATION,
Washington, D.C.

The subcommittee was called to order at 10 a.m., in room 5110, New Senate Office Building, Hon. A. S. Mike Monroney presiding.

Senator MONRONEY. The Subcommittee on Aviation will resume its hearings.

We are honored today to have the spokesman of business aviation, Mr. William K. Lawton, who has consistently been helpful in many of the problems spanning the whole spectrum of aviation. His fine organization represents those with multimotored up to four-motored planes and some jets now, and some Piper Cubs.

We are delighted to have you here, Mr. Lawton, and appreciate the opportunity to hear your testimony.

STATEMENT OF WILLIAM K. LAWTON, EXECUTIVE DIRECTOR, NATIONAL BUSINESS AIRCRAFT ASSOCIATION, INC.; ACCOMPANIED BY RICHARD GROUX, ASSISTANT TO THE EXECUTIVE DIRECTOR, NATIONAL BUSINESS AIRCRAFT ASSOCIATION, INC.

Mr. LAWTON. Thank you, Mr. Chairman.

I am William K. Lawton. Seated on my right is Mr. Richard Groux, assistant to the executive director.

I have, for the committee's information, enclosed on page 1 a brief description of our association for your information.

(The description follows:)

National Business Aircraft Association, Inc., is a nonprofit and independent aviation organization founded in 1947 as the Corporation Aircraft Owners Association and incorporated under the laws of the State of New York.

It was organized to represent the aviation interests of those persons, companies, corporations or other forms of business enterprise who own and operate aircraft as a normal part of their business or industry and to those engaged in supporting the operation, servicing and manufacture of business aircraft.

Among the fields in which NBAA is concerned are: Improvements in airways and airports, better weather service, expansion in communications and air navigation facilities, higher standards of airport services, improved aircraft parts distribution, equitable tax rulings for business aircraft operations, greater recognition of the airplane as a necessary tool in modern business and industry, better air traffic control procedures, professional status for qualified business pilots, and aircraft designed to meet the special requirements of business flying.

Our national headquarters is located at 344 Pennsylvania Building, Washington 4, D.C.

Mr. LAWTON. Senator Monroney, this association is honored by the subcommittee's invitation to appear and to make its comments and recommendations concerning the safety rulemaking, inspection and enforcement procedures of the FAA and of the conduct of accident investigations by the Civil Aeronautics Board.

As an association whose regular membership is composed of business organizations owning and operating their own aircraft as a normal means of transportation of their company personnel and in the conduct of their company's business we are seriously concerned with all aspects of safety in the air.

In order that we may be thoroughly understood it becomes pertinent at this point to define the several segments of what is popularly known by an overall classification of "business aviation."

Both the Civil Aeronautics Board and the Federal Aviation Agency recognize three categories in this broad area of business aviation. First are corporate executive aviation using aircraft whose gross weight is over 12,000 pounds. Such aircraft as the DC–3, Lockheed Lodestar, Convair, Martin, Viscount, Grumman Gulfstream are representative of this type.

These aircraft are flown by professional pilots. Second is the corporate executive aircraft whose weight is less than 12,500 pounds and which are flown by professional pilots. Aircraft in the popular light-twin class; the Beech E–18, Cessna 310, Aero Commander and Piper Apache are typical examples. The third class is defined as the personal business aviation whose pilots are not usually professionally qualified—holding commercial pilot certificate with instrument rating and whose principal occupation is other than that of being a pilot. The aircraft flown by the nonprofessional pilots are usually single-engined.

These business aircraft, in 1958—the last year for which complete statistical information is available—flew an estimated 5,300,000 hours. For comparison purposes, the scheduled air carriers flew an estimated 3,800,000 hours.

In 1958 the heavier corporate aircraft suffered two fatal accidents in which seven passengers suffered fatal injuries. In the lighter corporate aircraft there were six fatal accidents in which there were nine passenger fatalities. In the personally flown business aircraft there were 42 fatal accidents with a total of 69 fatalities.

In 1959—the first year of the FAA's existence—incomplete records show that corporate executive aviation has recorded one fatal accident with eight passengers and two crew fatalities in heavy airline type aircraft.

What the final statistics will show for the other two segments of corporate and business flying can only be estimated. We believe that it will show a similar figure as was shown in 1958 for the professionally flown aircraft and a significant rise in the fatal accidents in business aircraft flown by nonprofessionally qualified pilots.

Against this background of information we look at the FAA's rulemaking and enforcement record to see what FAA has proposed to do or has done to reduce these accidents in business flying.

In the area of physical qualifications for airmen—a subject which will at a later date be more fully developed—we have seen more stringent medical standards required for all airmen. How and by what

evidences these new rules were placed into effect will also be commented upon at the appropriate time during these hearings.

It should be pointed out at this time, however, that accidents due to a pilot's physical condition are not even mentioned as a casual factor in the most recent statistical analysis of aviation accidents published by either the FAA or the CAB.

In the realm of the training a pilot must receive before attaining a certificate, the FAA has taken one important and, we feel, constructive step: the requirement that applicants for private pilot and commercial pilot certificate must now have basic instrument flying training and familiarization in order that they may safely retreat when caught in weather conditions in which they are not permitted to fly without a full instrument rating.

One of the greatest causal factors of business flying accidents in the nonprofessionally qualified pilot group comes from the pilot encountering unforecast deteriorating weather conditions and, through lack of training or experience, continuing his flight into these deteriorating weather conditions.

Constructive steps have been taken jointly by the FAA and the U.S. Weather Bureau to alleviate this problem by the establishment of continuous aviation weather broadcasting stations in 88 areas covering the entire United States. This program is being accomplished at a minimum of expense in equipment and by judicious use of manpower. We believe that this program, when fully materialized, will have significant results and will help to reduce these weather-caused accidents.

Saving lives of pilots and their passengers through better weather forecasting and dissemination techniques is a program which NBAA has vigorously pressed before both Houses of Congress.

While some steps have been taken by Congress to permit this improvement in aviation weather services, there has not been budgetary action permitted by the administration to bring the aviation weather service standards up to the present requirements of civil aviation.

Immediate consideration must be given by Congress, we believe, to the implementation in significant numbers of Weather Bureau forecasters and observers.

Under the present manpower situation, the Weather Bureau forecasters are so few in number that, despite their professional abilities and knowledge, they are not able to consistently make accurate forecasts. They are forced, due to work load requirements, to give only a small percentage of their time to weather analysis with the result that weather forecasts given to pilots are not substantiated by the actual weather conditions encountered by the pilot.

This fact leads to highly undesirable safety situations. If the pilot accepts the weather forecast and departs to run into unforecast deteriorating weather, the pilot is placed in a critical situation. He must decide whether to turn back to the nearest airport or to continue on in hopes that the poor weather is of limited and local nature and that the weather a few miles down the line is better.

Too many pilots have taken the latter course and have met their deaths, serious injury, destriction of their aircraft, and created serious hazards to persons and property on the ground below them.

A second penalty also results from inadequate aviation weather forecasting. This is the economic penalty to persons or companies who have invested hundreds of thousands of dollars in their aircraft and who, because of a weather forecast, decide to ground their aircraft, cancel or defer their business trip, or are forced to proceed by other transportation means.

We have noted that many business aircraft operators who have cancelled trips, to be on the safe side of operations, could have flown their trips because the actual weather was suitable—by their own standards—for their operations.

The obvious loss of utility of the aircraft because of inadequate weather forecasting creates an artificial barrier in the acceptance of the aircraft for business use by many organizations who would be inclined to become purchasers of aircraft. This factor, plus the weather-caused accidents, has an undesirable and unnecessary effect on the sales of aircraft which, in turn, has a depressing effect upon the aircraft-manufacturing industry.

This association earnestly recommends that Congress take a long, hard look at the Weather Bureau's fiscal year 1961 budget request when it comes before the appropriation's subcommittee.

The Weather Bureau budget, after being screened by the Department of Commerce and slashed by the Bureau of the Budget will not, we feel certain, provide for any reasonable increase in either forecasters or weather observers.

In fact, if past Budget Bureau performances are a criteria, Congress will probably find that the number of aviation weather observers in the United States have actually been reduced in number.

This subcommittee is aware, I am certain, of the Administrator's vigorous action to "police" the air carriers operations. A somewhat similar campaign was placed into effect by the Business Aircraft Operations Branch of the FAA in July and August of 1959, when FAA agents throughout the United States made "surprise" inspections of corporate owned and operated aircraft to see if they were being operated in violation of their aircraft's weight and balance certificate.

FAA inspectors met these aircraft on their arrival at hundreds of airports. They carefully measured the amounts of fuel on board the aircraft, they minutely examined the passenger and baggage weights, they compared these with the completed flight log, and then computed the legal weight of the aircraft at takeoff time.

Between 700 and 800 aircraft inspections were made.

The FAA reports not one single violation has been filed as a result of these inspections. And I note here that this is obvious omission in the Administrator's statement where he, in his testimony, presented the facts but ignored what we believe is a significant fact, that there were no violations reported.

The Business Aircraft Operations Branch is a new concept and came into being with the creation of the Federal Aviation Agency. Formerly business aircraft operations were included in the General Aviation Branch which supervised all non-air-carrier civil flying.

The Business Aircraft Operations Branch has taken measures to flight-train FAA personnel in aircraft most commonly used in the business aircraft fleet, and their inspectors have proven highly effec-

tive in their "in-the-field" relationships with the business-aircraft pilots and owners.

The fact that the corporate aircraft fleet owners and their pilots are seriously aware of their safety responsibilities is evidenced in many other areas. One of the most notable is the insistence by many of these companies that their pilots receive periodic and, at least, annual pilot qualification check rides.

This is a program which the air carriers are required to carry out by regulation. In the case of business flying this has been done voluntarily and, I may add, at considerable expense, to the companies involved.

Our association, with the approval of the National Safety Council, has established a system of safety awards to business pilots and to the companies who have outstanding safety records. In 1959 there were 51 companies and 165 pilots who received awards for having completed 165,620,468 miles of business aircraft operation without damage to an aircraft or injury to a passenger.

This safety award criteria is significantly more demanding than that set by the air carriers who receive awards based on the standard that merely no passenger fatalities were recorded by the recipient airline.

In matters of air safety, one of our concerns lies in the affects of the relationships between the Civil Aeronautics Board and the Federal Aviation Agency in accident investigation. We have sound reason to be concerned as the following tragic sequence of events will illustrate.

On December 15, 1958, a twin-engined aircraft operated by a company which is an NBAA member, crashed in the New England area. Seven lives were lost in this crash.

The Civil Aeronautics Board investigated the circumstances of the accident and one of their first findings gave rise to serious doubts about the adequacy of the carburetor induction heat system for this type of airplane and recommended to the FAA that it be reevaluated and more specific instructions for its use be provided.

The FAA advised that it believed the carburetor heat system was adequate, but that portions of the flight manual pertaining to deicing procedures be rewritten so that all pilots would be informed of the most effective deicing technique.

Upon publication of the CAB's report on this accident in September 1959, this association, in conjunction with the company, owning the aircraft, took immediate exception to many parts of the report and to the conclusions of probable cause of the accident as stated by the Board.

The Board, upon our joint request, granted an informal hearing at which time facts and circumstances surrounding the accident were reviewed. The Board was made aware of joint dissatisfaction with the FAA's rejection of further examination of the adequacy of the carburetor induction heat system.

The Board then directed its staff to make a complete examination of the subject which eventually led to a second letter of recommendation on January 7, 1960, from the Civil Aeronautics Board to the Administrator of the Federal Aviation Agency. I present this second

letter to the subcommittee for inclusion in the record and for their study and evaluation at appropriate time.

(The letter follows:)

JANUARY 7, 1960.

Hon. ELWOOD R. QUESADA,
Administrator, Federal Aviation Agency,
Washington, D.C.

DEAR MR. QUESADA: Lockheed Learstar N37500, owned and operated by the Johnson & Johnson Co., crashed near Woonsocket, R.I., on December 15, 1958.

The Board's investigation disclosed facts and circumstances from which it concluded that induction icing was a major causal factor. The investigation also disclosed a complete lack of uniformity in the procedures employed by Learstar captains in combating carburetor icing. In light of this information, the Director, Bureau of Safety, Civil Aeronautics Board, on January 7, 1959, addressed a memorandum to the Director, Bureau of Flight Standards, Federal Aviation Agency, recommending (1) that the Learstar carburetor heat induction system be reevaluated to determine whether any modification was necessary, and (2) that information on the most effective procedures for use of carburetor heat and/or alcohol be provided to Learstar operators.

On June 9, 1959, the Bureau of Safety received a reply from the Director, Bureau of Flight Standards, which stated that a manual revision relating to the proper uses of carburetor heat and alcohol was being prepared by PacAero, manufacturer of the Learstar. In addition, the reply advised that a supplemental type certificate had been issued for an alternate fuel-metering system to improve the safety of the airplane but stated, "We do not propose to make this modification mandatory since information available to us indicates that the Learstar has sufficient carburetor anti-icing and deicing provisions if proper operating techniques are employed."

Subsequently, a flight manual revision was prepared by PacAero and approved by the Federal Aviation Agency on August 28, 1959. This revision, however, appeared to place primary reliance upon alcohol for the prevention and elimination of induction icing and indicated that carburetor inlet air preheat was a method to be used if alcohol was not effective. Carburetor alcohol is not a required item under the part 4b certification on this aircraft. An inquiry to PacAero concerning the intent of this manual revision resulted in a further preliminary revision recommending carburetor inlet air preheat as the primary method to be used in combating induction icing. The Board has been advised by PacAero, however, that this second proposed revision will probably be modified in light of recent carburetor inlet air heat rise tests conducted on a typical Learstar under actual operating conditions.

Irrespective of the still-unresolved question of adequate flight manual information, the adequacy of the Learstar carburetor induction heat system is still seriously in doubt. In the continuation of the investigation of the Johnson & Johnson accident, the Board has received information from a number of Learstar operators indicating a widespread dissatisfaction with the adequacy of the carburetor inlet air heat rise.

On December 5, 1959, carburetor inlet air heat rise tests were conducted by PacAero on Learstar N–20L. Representatives of the Civil Aeronautics Board participated in these tests.

Under the test conditions specified in part 4b, this aircraft failed to achieve the required heat rise. This test further disclosed a highly stratified air flow through the carburetor, which, in effect, nullifiies the pilot's attempt to carry adequate preventive carburetor air preheat in combating induction icing. Since the carburetor air inlet ducting geometry is vertually identical in all Learstars, it is probable that this stratification problem exists in all such aircraft.

In addition to the problems specifically peculiar to the Learstar, the tests on N–20L raise a serious question as to the adequacy of the heat rise standard for high-performance aircraft, particularly as related to the heat available at low power in the letdown configuration, and the testing procedures employed to demonstrate the required heat rise. This latter problem is apparent from the discrepancy between the computed heat rise of 114.7° F. at N–20L (PacAero Rept. No. 72), achieved by extrapolating the data derived from tests conducted at temperatures well above 30° F. and the actual heat rise of 93° achieved on this same aircraft when the tests were conducted at 30° F. outside air tempera-

ture. It appears that cylinder-head temperatures should be considered in the testing procedures as well as a determination of any stratification problems incident to any given installation.

In view of the foregoing information, it is recommended:

(1) That the adequacy of the Learstar induction heat system be reevaluated with respect to heat rise and stratification;

(2) That the 100° heat rise standard as prescribed in section 4b.461(b)(2) of part 4b of the Civil Air Regulations be reviewed when applied to high-performance aircraft in the Learstar category, particularly with respect to heat availability in the letdown configuration; and

(3) That the testing procedures used when demonstrating heat rise capabilities include cylinder-head temperature accountability where tests are not conducted at 30° F. outside air temperature.

Sincerely yours,

——— ———, *Chairman.*

To summarize the Board's recommendation to the Administrator, the letter clearly states, that the adequacy of the aircraft's carburetor induction heat system is still seriously in doubt, and that these conditions may also effect other high-performance aircraft.

Senator MONRONEY. Could you, for the information of the committee, give us the type of aircraft you are talking about?

Mr. LAWTON. The Lockheed Learstar.

Senator MONRONEY. Does this have an engine common to many others in use on other types of planes?

Mr. LAWTON. This is correct, sir.

Senator MONRONEY. Actually we are talking about the engine and its reliability under icing conditions.

Mr. LAWTON. It is more than the engine, Senator. It is the combination of the engine enclosed in a certain type of nacelle with certain types of air lead-ins and certain types of heating and heating-sensing elements in connection with the nacelle and the engine. The engine itself is not circumspect.

Senator MONRONEY. We are not talking now about the deicing on the airframe or boots?

Mr. LAWTON. No, sir.

Senator MONRONEY. We are talking about the propulsion unit?

Mr. LAWTON. Yes, sir.

Senator MONRONEY. This propulsion unit would be common to other types of business aircraft, and perhaps other aircraft now being flown; is that correct?

Mr. LAWTON. That is correct.

Senator MONRONEY. That is what I am trying to get. It is a general problem which would affect a great many aircraft and not the limited number, which airframe was involved in this accident?

Mr. LAWTON. That is correct.

Senator MONRONEY. I just wanted to clarify it.

Mr. LAWTON. The Federal Aviation Agency, we believe, on the basis of this report and from other occurrences, has failed to fully comply with section 610(a) of the Federal Aviation Agency Act of 1958 which provides that:

The Administrator is empowered and it shall be his duty to promote safety of flight of civil aircraft in air commerce by prescribing and revising from time to time:

(1) Such minimum standards governing the design, materials, workmanship, construction, and performance of aircraft, aircraft engines, and propellers as may be required in the interest of safety.

This association has been concerned about the apparent lack of direction within the FAA in terms of increasing the efficiency of their engineering and manufacturing division. This concern is reflected in an editorial which was carried in the August issue of Skyways magazine, the official publication of our organization.

Because this editorial reflects what we believe to be an unchanged situation, and because of its great importance in the matters concerning air safety, I ask the chairman's consent to allow it to be read into the proceedings of this hearing.

Senator MONRONEY. This will be done.

Mr. LAWTON. May I read the editorial?

Senator MONRONEY. Yes.

Mr. LAWTON. The title is "Air Safety Means More Than Just Good Air Traffic Control."

The public and congressional mandate that created the Federal Aviation Agency came, primarily, as the result of tragic air carrier-military midair collisions. These midair collisions came as the result of Bureau of the Budget's and congressional niggardliness in appropriating funds to establish an air traffic control system which should have kept pace with the dynamic explosive growth of all types of civil and military aviation.

With the creation of the Federal Aviation Agency, and the appointment of Elwood R. Quesada as its first Administrator, it was obvious that air traffic control would and should receive the highest priority in research, development, equipment, improved techniques, regulations, and in manpower.

The Administrator and his staff have done a tremendous job in the few months available to them. Coordination between military aviation and civil aviation personnel has rapidly been effected. Military equipment and personnel have been linked into the air traffic control system. Enforcement of air traffic rules has been vigorously prosecuted at both civil and military levels.

These air traffic control measures taken by the FAA have been clear cut, decisive, and dynamic.

These FAA programs deal, however, only with one phase of air safety.

What about air safety as it pertains to the design, materials, workmanship, construction, and performance of aircraft, aircraft engines, and propellers?

Under the Administrator, these air safety items fall into the hands of the FAA's Engineering and Manufacturing Division.

There has been no significant change in the numbers of personnel who are charged with setting up minimum standards concerning construction, overhaul, or servicing of civil aircraft.

There has been no significant change in the Division's direction in handling certification of new, highly complex jet aircraft. There has been no significant increase in the field staff in numbers or in their qualifications.

Where aeronautical industry places hundreds of engineers at the drafting boards to complete the design on one aircraft, the FAA is fortunate to have—in proportion—one FAA-qualified engineer to evaluate the data presented in connection with the type certification. When industry, for example, presents reams of IBM reduced data to support stress analyses, the FAA is not able to check these figures. They must be content to examine the methodology of the manufacturer's approach to stress analysis. If the approach is correct, the inputs to IBM are examined and the results assumed to be correct.

The recent experiences with the Lockheed Electra, where the aircraft was FAA certificated before flight tests revealed that the engines were inclined 3° too low and thereby created undesirable flight characteristics at certain speeds, is an example of the safety problems not yet vigorously attacked by the FAA, primarily due to lack of qualified personnel.

The demand by the public and by the aviation industry for infallible air traffic control has a close running mate: the demand for aircraft and engines which are subjected to highly qualified FAA examination during their development, manufacture, operation, servicing, and overhaul.

Air safety means more than just good air traffic control or enforcement. We urge that the Administrator take equally effective steps in strengthening and implementing the FAA's Engineering and Manufacturing Division at all professional levels and in numbers which will assure air safety before the aircraft leaves the ground.

That is the end of the quotation of the editorial.

Returning to the subject of the Civil Aeronautics Board's accident investigation authorities as defined under the terms of the present act, we have noted with growing concern that full budgetary support has not been lent to enable the Board to completely fullfil its responsibilities. We petition the Congress to carefully examine the CAB's budgetary requests, as approved by the Bureau of the Budget, and to closely question the representatives of the Board as to their actual needs in order to carry out their ever-increasing workload to a satisfactory conclusion.

We do not believe that, because of some areas of failure or lack of direction or emphasis, the FAA can justly be categorized as being led by a militaristic despot nor that the methods under which FAA has chosen to operate in their dealings with civil aviation organizations can be called completely unilateral, arbitrary, and capricious.

We do see a great body of men and women working through a vast transition stage in which a new Agency was born in times of revolution in the use and numbers of aircraft under new conditions and new circumstances.

That the FAA has been able to accomplish as much as they have with as few critical mistakes as they have made—is indeed a revolution in government itself. Thank you.

Senator MONRONEY. Thank you very much Mr. Lawton, for your splendid statement and the thought and preparation which went into it.

One thing I would like to ask. We have had testimony from the Air Transport Association as of yesterday regarding the rulemaking procedures. We anticipate, because of previous published statements, criticism of the FAA, rather strong language from the Airline Pilots Association, and from the Airline Owners & Pilots Association—both groups you might say representing the transportation industry have been critical.

Your reference to dealing with the FAA on rulemaking leads to the question of whether you feel that enough consideration or consultation with the industry, and those who must abide by the rules or who are directly and rather importantly affected by such rules, has been given? Do you consider a fair opportunity has been given to appear before the rule is actually generated and approved in the minds of most of those who run the Agency?

In other words, I detected from the ATA's criticism, while they admit that it complies fully with the letter of the law, in the Administrative Procedure Act, it does not quite comport with the normal consultation with those affected by the law before it becomes a matter of record and a matter of final rulemaking language within the scope of the act.

Mr. LAWTON. Senator, I must say that the FAA's performance in this particular area of coordinating their thoughts and problems with industry prior to the writing of the notice of proposed rulemaking, has

been good in a few areas, but overall I must agree with the comments made by Mr. Tipton that a vast area of improvement is needed.

We have planned to talk further on this in connection with air space management, in which area we believe that the Agency has been particularly deficient, both to the detriment of the airway user, but more particularly to their own detriment. We have had a hard job convincing them of this latter area of detriment.

In some phases of the FAA's various bureaus we have people who are, I would say, exceptionally conscientious in advising us of their thinking. We have been called in at various times to be brought up to date. Here is what we are thinking about; what are your thoughts on it. This has proved to the people in FAA from past experience to be valuable.

In summary, we can say in some areas it has been good; in others, unfortunately on the larger areas, it has not been good.

Senator MONRONEY. You were one of the most effective witnesses in the hearings before this committee on the writing of the FAA Act. We were faced with one extreme at the other end of the spectrum where there was so much consultation and so much reconsideration, so much division of comment and further consideration that finally no rule or action could hardly be taken in the field of aviation safety without a long period, or perhaps an indefinite and unendurable period of consultation before anything happened.

Would that be a fair summary of the situation aviation then faced under the old procedure?

Mr. LAWTON. This was particularly true in the actions and systems under the old airport and aid system, and their management of airspace where the Government agencies, military each had a vote, Civil Aeronautics Board had a vote, and so forth, and with a voting procedure this obviously proved to be an unmanageable and unworkable system.

We don't and will never suggest—I say "never" under the light of present circumstances never—that a voting procedure which is binding upon the Administrator be reinstituted.

All we have asked for, basically, is the chance to be consulted so that the FAA's thinking will be based upon knowledge of the persons and the industry's viewpoints. This cannot be gained to the FAA's advantage through solely reliance on comments filed to a docket section.

The free interplay of opinions of knowledge, of experience, where the air carrier representatives sit at one side, the private pilot's organization sit at another side, the military on another side, our organization, the State aviation officials and so on, each association has a wealth of knowledge to afford to the FAA.

The opportunity to present this knowledge has not been fully developed internally in the FAA. It makes no change whatsoever in the Administrative Procedure Act. It compliments it to its highest degree if the FAA Administrator will so instruct his people to exercise this what we consider a basically democratic procedure, to allow persons and industry to consult with Government prior to rulemaking so that the rulemaking will be with knowledge.

We are afraid in many cases it has been made in a vacuum.

Senator MONRONEY. How do the present FAA procedures compare with the old procedure when the CAB had charge of rulemaking?

Mr. LAWTON. Under the terms of the Civil Aeronautics Act of 1938, the Civil Aeronautics Board was then the rulemaking body. It was also the body to which appeals could be presented.

Under the Federal Aviation Agency Act of 1958, the rulemaking authority was removed from the CAB to the FAA.

I have talked and listened to many knowledgeable gentlemen in the legal profession on this subject. They feel that under the present act that the pilot or aggrieved party or person now has an appeal to the Administrator. If this is not satisfactory, he then can appeal to the Civil Aeronautics Board in many, many cases.

In effect, the legal thinking, which I have been exposed to, indicates that now in effect we may have more in the appeal authority then we had previously.

Senator MONRONEY. Would you say just roughly—and this doesn't include everything—there is nothing much wrong with the FAA rulemaking procedures that a few more public hearings among the people who are involved in these rules wouldn't cure?

Mr. LAWTON. Public hearings in this sense, Senator. Public hearings as defined in the act or after the notice of proposed rulemaking has been exposed through the Federal Register. This incidentally we have not been favored with too often by the Administrator in a public hearing.

This will be expanded upon at great length I am sure by many others.

We believe that if the Agency will expose itself to knowledge before they write the notice of proposed rulemaking, that a great number of requests for public hearings afterward will not be necessary; that we will have a notice of proposed rulemaking which still is subject to comment by everybody, but the proposal will be based upon thorough knowledge from all sides.

We think that the Agency will save itself a lot of time, trouble, heartaches, and public hearings if they will take this one further step in the many areas in which they are not now exercising it.

Senator MONRONEY. In other words, consultation before the language is wrapped up, rather than after it is all neatly tied up and then handed to you and say, "If you don't like it we will listen to you now, but please file it in writing."

Mr. LAWTON. Yes, sir. The free exchange, Senator, is the most basic part of this, where the air carriers obviously have certain operational knowledge, they have certain operational requirements. The airline pilots also have this same vast amount of knowledge; which is largely being lost and confined into a narrowly constructed Docket Section routine which is not conductive to good legislation.

We feel that this is one of the greatest areas of change which the Administrator can make without any amendment to the present act.

Senator MONRONEY. And it doesn't have to bog down as ICC rules and even the proposals for airline extensions of routes before the CAB, which seem to go on year after year after year interminably with interventions and appeals and stalling procedures. It could be effective without being dilatory, could it not?

Mr. LAWTON. Very much so.

Senator MONRONEY. Congress has operated for a great many years and has always relied primarily on public hearings for perfecting legislation before it reaches the floor. By that we mean the right to be heard orally and not by merely submitting statements after the bill has reached the floor.

Mr. LAWTON. It might be pertinent at this juncture, Senator, to refer to what the Agency in its own writing has defined the use or usefulness of a public hearing.

When they announced the rulemaking concerned with the airline pilots not being allowed to fly after age 60, there was one, rather to me at least, significant portion of their preamble in which they said:

> We have not granted public hearings, although they have been requested by a number of affected and interested associations, because—

and this is it in essence—

> we feel that a public hearing will do no more than emphasize what is already put into the written document. We see no reason—

this is just the FAA's statement—

> a repetition of what we received in the Docket.

I don't believe this is an acceptable or knowledgeable view. Obviously in a public hearing under FAA's criteria, where no cross-examination is held, there is the chance to have an evidentiary hearing in effect where one side presents its story and a rebuttal is presented by another side, and the information can be made to the public.

In the case of the airline pilots at age 60, which is a classic example of bureaucracy at its best, in the area in which the public—no one in the public knows one sound reason why this rule was put into effect, the public was denied, because of the lack of public hearing, to get out and get the word why this decision was made.

I might, I think, say there are darned few, except possibly in the Civil Air Surgeon's office, who have any factual evidence on this score.

This is just one case in point, Senator. But I believe that if the FAA receives this encouragement and direction, that a great many of these problems can be resolved.

Senator MONRONEY. Thank you very much.

Senator Engle?

Senator ENGLE. What you are saying is that after you get a proposition published in the Federal Register, then the FAA is in a position, at least some of its people are, of defending and being committed in their thinking to a document that they have already put in existence. As a consequence you don't get at the case in the formative stage, is that right?

Mr. LAWTON. Under the present system, where the Agency or the Bureaus under FAA do not consult with the user organizations prior to making a notice of proposed rulemaking, this is the area in which they have fallen down.

Under these circumstances you have cited, Senator Engle, where they come up in their own—as you said you wake up on your pillow and think of a regulation and put it into effect—in talking to General Quesada—this is the area to which we object. We feel that if the notice of proposed rulemaking is thoroughly aired, with the user agencies, the affected people, that the proposed rule in itself will be largely a clean one. It will not satisfy everyone. There is no rule,

regulation, or any enactment that satisfies everyone. But it will, by and large, satisfy the majority. And the views, the opposing views, if there be any, between user organizations, will thoroughly be aired, and then, when this proposed rulemaking is put into the Register and comments are called for to go into the docket, we know what the opposing views are, both from the Government end and from other organizations.

We can then, even in the docket section, intelligently comment and present arguments for our own position, arguments against the other man's known position.

And in this way I think we will get intelligent rulemaking.

Senator ENGLE. Is there any provision now for the type consultation you are talking about?

Mr. LAWTON. Under the terms of the Administrative Procedure Act, this is not prohibited.

Senator ENGLE. But it is not affirmatively directed, either?

Mr. LAWTON. It is not affirmatively directed, under the terms of the Administrative Procedure Act, to my knowledge. The reason I make this rather strong point that this direction be given to the FAA, to resolve what is obviously a critical situation in rulemaking.

Senator MONRONEY. This does not necessarily require a change in the law?

Mr. LAWTON. It does not.

Senator MONRONEY. It is merely a suggested change of the pattern of organization of rulemaking within the Agency, subject under the law to handle it in any way they wish up until the time that the proposed rule is made an effective rule?

Mr. LAWTON. That is correct, sir. The Agency, in my belief, has to lean heavily on the bare bones of the Administrative Procedure Act in many areas. This is, I think, deleterious to the overall air safety problem.

Senator MONRONEY. In other words, they are relying more on the letter of the law than on the spirit of the law?

Mr. LAWTON. I think that is an excellent summary.

Senator MONRONEY. Excuse me for interrupting. I merely wanted to clarify it.

Senator ENGLE. What would you think of providing for an appeal to the CAB on a rule promulgated under very carefully defined conditions where there was substantial disagreement?

Mr. LAWTON. Senator, this has been a subject of discussion prior to the enactment of the Federal Aviation Agency Act of 1959. The record of the hearings at that time show that we commented upon this particular thought in great detail.

At that time an amendment was suggested which would, upon presentation of substantial economic penalty to the user by some regulation, that this could be appealed to the Civil Aeronautics Board.

We thought long and hard on this. With our limited talents and resources that we have available we looked at what other agencies, rulemaking agencies, have—the ICC and other independent regulatory bodies—and the methods of appeal from their regulations.

We find that right now, with the act in its present form, under most conditions a person has the right to appeal to the administrator

of the rulemaking body, of the FAA, that under a great majority of conditions he also has a further appeal to the Civil Aeronautics Board. Previously the Board was the rulemaking body and your right of appeal to them was to them, to the rulemaking authority. Now you have both the appeal to the rulemaking authority, the FAA, and a subsequent right of appeal to the Civil Aeronautics Board.

I think—and you gentlemen certainly are much more knowledgeable in this field than I—that this is an appeal which is not evidenced in any other regulatory body. I believe the procedures are, if you fail in your appeal to the regulatory body, you go to the courts. We have an additional step now under the act.

We will freely admit, and we stated when the hearings were being held, that if the FAA did not exercise its authority and the resultant regulations were arbitrary or capricious or not coordinated with industry to a great extent, that an appeal to the authority would be considered. Senator Monroney recognized this and said to us that if the FAA does not, by and large, meet the measure, then the place to appeal is to the Congress.

We know this, and we have examined it. And we believe that with improvement in the one area that I have indicated, our problems will be largely resolved.

At this time we do not ask for a consideration of any amendment to the act which will permit this large-scale appeal to the Civil Aeronautics Board that has been suggested.

Senator ENGLE. Are you saying that presently you have an appeal to the CAB on the writing of a new rule? As I understood, the appeal to the CAB, when it occurs, is by the individual as to whether or not he has violated the rule, not as to whether or not the rule should be put into effect in the first place.

What I am thinking in terms of is an appeal where major segments of the industry regard the rule itself as bad and one that should not be put into effect; that is, that the decision of the FAA Administrator to put the rule into effect should be subject to appeal.

I want to be sure we understand each other.

Mr. LAWTON. I am glad you clarified it, Senator.

If a rule, in the opinion of the industry, is arbitrary and capricious, or because of the nature of the rule, you have the obvious appeal to the courts which recognizes, as you will, I am sure, point out to me, that this is reviewed on procedure.

But it extends to more than procedure. It also extends to the right, let us say, of the Administrator to issue such a rule. Is this within his prerogative?

I will ask the Senator, if I may: What provisions are made, let us say, under ICC or under the Maritime Commission when a rule is promulgated by the authority, and let us say the steamship industry doesn't like it. What procedure do they follow under our present structure of law?

Senator ENGLE. I am not sure they have any. But that doesn't convince me that they should have.

Mr. LAWTON. This I leave to you gentlemen to consider for yourselves. If aviation is to be allowed this, then I think we have opened the door to every other agency in the transportation industry. If this is desirable, then I think this is a subject for Congress to consider.

But I think if we open the door to one, we are bound to open the door to the other.

Senator ENGLE. Perhaps, and maybe not. Regulating a fast-growing industry like aviation is one thing. They even run steamships together out in the ocean, and sink them, and nobody comes in here and says we ought to investigate the daylights out of everybody and have an administrator. I don't know how they run a steamship as big as this building into another, with all the radar they have. That accident, the *Andrea Doria*, I am speaking of, was more atrocious to my mind than anything which occurred in recent times.

Each industry is a little bit different. I wouldn't say that the precedent which exists in other fields would necessarily bind, or the fact that it exists would mean that we shouldn't have it in this particular area.

Senator MONRONEY. If the Senator will yield: Isn't it a fact that the FAA is an operating agency, which because of additional problems that aviation faces, is a far more closely regulated agency, and the procedural operations are closely regulated, the weight tolerances, the reserve gasoline, and many other things, to avoid crashes that would not necessarily occur in the other fields of transportation that are closely regulated. Therefore, the rulemaking more appropriately belongs to the operating agency, with proper appeals which the FAA Act sought to put in where individual human rights were involved to the CAB.

There is a close question that I think we will have to further develop in extended hearings on whether human rights can be shifted by mere rulemaking en masse, and the individual concerned with the effect of that rulemaking then would have no appeal because there had been a rule promulgated. That was the reason that we put aside a portion of the time of these hearings for a study of that, to determine personal rights, which we attempted to guarantee with an appeal procedure, a double appeal procedure, actually, first to the Administrator of the Agency, then to the Civil Aeronautics Board, and then to the courts.

Senator ENGLE. Let me say that I just don't believe that the appeals provided for are actually appeals on the question of the propriety of the rule. They are appeals that go to compliance with procedure and whether or not the rule is so bad that it gets into the area of being unreasonable and capricious. In other words, the appeal is very limited. The basic appeal is to the man who made the rule. As a country lawyer, I just feel a little uneasy about appealing to the fellow who convicted me in the first instance.

Senator MONRONEY. That is what we are going to try to resolve in the whole time that we have provided for an examination of this rulemaking facility. It was merely to interject at the point here to a line of testimony, if we could, of this large group of aviation people in business aircraft, their opinion of whether the rulemaking procedure, generally speaking, and not specifically to qualifications, had been fully met in the ideals of the act, or rather merely in following the letter of the act in this strict interpretation of the requirements of the Administrative Procedure Act.

I think we will get into the more fully, unless there are other questions on this line, we would rather pursue the safety features that are the subject of the immediate inquiry.

I think the Senator from New Hampshire has a question.

Senator COTTON. Yes.

Mr. Lawton, first I would like to commend you for a very constructive statement, and compliment you on the tone of your statement. I think that it is fair, it is restrained, it is consructive, and very thoughtful. I think your suggestions as to seeking a means of using the facilities and the personnel of your great organiaztion to cooperate with the FAA in its work is an excellent approach.

There are one or two matters that I think you are specially qualified to enlighten the committee.

In general, do you believe there should be a very marked difference in the standards, safety standards, applied to business and private pilots and craft than those applied to craft that are operated to carry passengers for hire?

Mr. LAWTON. Senator, I will have to answer that by saying it depends on the situation and circumstance presented. Overall, I believe that the philosophy or the history of the philosophy of government is that when the public, the uninformed public, requires protection, Congress has seen to it that the regulatory agencies provide this area of safety.

When it revolves around the use of implements, of articles of transportation for private use, that the view has been that the strictures are not to be as great; that public interest has always resulted in a more severe operating penalty on all forms of transportation.

I think the parallel applies when you view the steamship versus others, and State and Federal on bus transportation against private automobile. I think this philosophy should be and must be extended in air transportation.

There may be some slight margins of difference, but I don't believe that they are truly significant.

Senator COTTON. I interpret that answer as indicating that while you think there should be some differential, it should not be great; is that right?

Mr. LAWTON. No, sir. I think again it depends upon the specific areas in which we must examine. For example, airframe, the certification of aircraft, as we have mentioned, we must have good standards. Where the air carriers have a greater utilization of their aircraft—for example, the average airline airplane is used—and I will admit this figure is a guess—say, 3,000 hours per year, they have to keep these airplanes in the air to make money. This is the business they are in.

The private aircraft utilization averages in our business fleet somewhere in the neighborhood of 550 hours per year. We are thereby enabled to keep a very high level of maintenance because our aircraft are on the ground and in the hangars much more so than are the air carriers.

I believe that the records of structural failures, of airframes, airline against private aviation, bear out the fact that in general the present rules and regulations are satisfactory.

Senator COTTON. I gathered from your excellent statement, however, that you feel that the FAA should have the funds, the personnel, and be equipped to extend its inspection services and its checking services even in the case of general aviation?

Mr. LAWTON. Yes, sir, this would be desirable, with certain limits. We don't expect that the FAA will have one inspector for every airplane and kick the tires every time an airplane goes out.

They have done a good job in supervision and regulation of the great numbers of fixed base operators who act in effect as garages for the privately owned aircraft.

They have on the other hand taken in some areas the approach that you suggest, that the equipment—for example, to get down to the field of the suggestion that was made by the FAA—that all radio and navigation equipment used in private aviation meet the standards of air carrier operation.

This has been fought vigorously and with great cause by the private aircraft owner. I include in here all non-air-carrier operators.

The weight and size, for example, Senator, of radio equipment which is standard and meets prescribed standards for the airlines—and incidentally, I must add, they were developed largely by the airlines and on their recommendations were made into a technical standard order which the airlines have agreed to and which they will meet, but these boxes which they use on the DC–6, and even on the DC–3, are large. They cost a lot of money, and they are also designed to meet airline operational requirements of great variations in temperature, of withstanding a great series of high-stressed landings. The g loading on equipment, which are airline standards, are not necessary for general aviation.

We feel that if the radio and navigation equipment on non-air-carrier aircraft will do the job of keeping the man on his track within acceptable limits, will meet a safety standard of reliability and accuracy, that this is sufficient.

But we have had some great indication from FAA—and I will not even comment on the source of their direction on this—to have all aircraft meet the airline standards. This is obviously unnecessary and does not contribute to safety.

Although our association aircraft by and large use this equipment because it fits their aircraft and their pocketbook, we also have in our association a great number of aircraft that, while they may be able to afford it, they couldn't physically contain this equipment in the aircraft, nor could the aircraft sustain it from electrical power requirements.

Senator COTTON. Mr. Lawton, perhaps I feel more keenly about this subject than I otherwise might because of some experience we have had in my own section of the country with which you may be familiar. And I think that they should be in the record, if the chairman will permit.

Senator MONRONEY. Certainly.

Senator COTTON. On February 22, 1959—and I suspect you are familiar with this rather famous case—two doctors connected with the Hitchcock Clinic in New Hampshire, the largest clinic north of Boston—the largest and best in northern New England—two doctors flew a Piper Comanche on an errand of mercy to Berlin in northern New Hampshire.

Dr. Miller—Ralph E. Miller—who has been a friend of mine for many years, who was State pathologist and medical referee during the 10 years that I was prosecuting attorney for the county in which we

both lived, who is an experienced flyer, who has been flying for many, many years, flew the plane and had with him a young, brilliant doctor, 32 years old, Dr. Quinn.

In spite of Dr. Miller's experience he started back from Berlin to Lebanon in a snowstorm, started to return after he had shopped around and tried to get high-octane fuel because he felt his fuel reserve might be a problem. He took off and landed and then took off again, in his persistence to get back home and to the hospital, with this young, brilliant doctor with him.

They disappeared and a search ensued until the following May when the plane was found near Lincoln, N.H. It had gone down into a deserted region, into a gully or ravine so that it wasn't visible even though planes flew over it.

The plane was not smashed. While it had some damage, it was almost intact. The instrument board, according to the reports and records, was almost intact. Both doctors survived. One doctor had a broken jaw but the other had no injuries at all.

They built a fire, they tried to exist in the cold winter. They tried to attract attention. They couldn't get out. They were deep in the forest. They wrote notes that are both pathetic and dramatic. In one of those notes which Dr. Miller wrote just before he finally died, he gave reasons for the accident, indicated that he wished he had had certain signal equipment in the plane for attracting attention and that he was leaving it, before his death, in the hope that it would benefit future aviation and this type of plane.

The loss of these doctors—this young doctor; Dr. Miller was 60 and the other was 32—from a coldblooded standpoint alone is a tremendous loss.

To me that is almost an epic in this field of business, professional, private flying. It makes me feel very strongly what I know you feel, that while no agency of the Government should burden private flying with a lot of instruments that are cumbersome and necessary in huge planes but not practical for smaller planes, that there ought to be very rigid standards for the kind of instruments, the kind of equipment—we are not talking about pilot qualifications now, because the chairman has very wisely and prudently suggested that that be deferred, but I think you will probably agree with me, representing as you do this organization, that so far as is practicable, this sort of thing should be guarded against, and the fact that that brilliant young doctor, 32 years old, wasn't paying for his passage but was flying on a common errand with the pilot, doesn't in any way minimize the factor of human life and human values, does it?

Mr. LAWTON. It certainly does not, Senator. I am not aware of all the details of the accident. The net result of the tragedy made a very deep impression upon myself as I know it has done on many others.

We did something about this.

Senator COTTON. You have anticipated my next question.

Does your organization promulgate to its members recommendations about equipment, recommendations about safety practices, and that is exactly what I think you are about to tell me and that is what I was leading up to; I appreciate that.

Mr. LAWTON. Thank you, Senator. We have done that in many respects, but more specifically in relationship to this accident.

Shortly after the accident to which you referred we were in contact with a large manufacturer of radio equipment. As a result of our talks with him, we distributed a questionnaire to all of our membership, giving a proposal for a rescue beacon which could be carried by light aircraft.

This would not be an integral part of the aircraft. This would be something that if the person making a flight over such territory as the doctor made, he could pick this up, he could rent it, he could put it in his airplane, and in the event of a crash or a forced landing in which the people survived, could turn this radio rescue beacon. It would transmit a signal which would pinpoint the location of the aircraft.

This survey was sent out by our organization without any commercial tie-in. No one knew, in our organization, who the manufacturer was. He listed certain numbers of questions, saying this is the basic idea, these are the frequencies we are thinking of using, this is the size, weight, shape of the rescue beacon.

We received a great number of replies. These were collated and forwarded to the manufacturer. We have reason to believe that he is about to make this available to the public.

There are in existence now some search and rescue beacon equipment. But they are of such size, weight, and cost, that they are not generally available or acceptable to the light aircraft operator. This one will be.

Senator COTTON. This leads me to ask you, would it be your recommendation, for instance, to the FAA, that if and when such beacon equipment became available in the size and at a reasonable price—with the size that would make it practical for small and large business planes—would it be your recommendation that a rule be made that they must be included in the equipment of these planes?

Mr. LAWTON. I would consider it on this basis:

Assuming that from a size, weight, and cost standpoint, that this could be accommodated by the minimum aircraft, I would consider that this could be made a requirement to be carried on certain types of flights under certain types of conditions. But this is the reason why we have suggested that in the process of rulemaking that the viewpoints of all organizations be heard.

This would be my viewpoint or first consideration. I am quite sure that the Aircraft Owners and Pilots Association, the National Pilots Association, and other groups would have recommendations to make on this. But I would venture this: That if these conditions are satisfactorily met, that we would have an almost unanimous endorsement of such.

Senator COTTON. I once had a boat in New Hampshire, and it wasn't worth much, and a fellow came along every year to see that I had lifebelts in that boat. It was a part of the equipment and you would have your registration taken away from you if you didn't have it.

Some of the equipment such as you suggest—and which you and your organization has with laudable progress been working on—shouldn't it be made a necessary part of the equipment, not just be

in the plane when the plane is flown under certain conditions, in cold weather, in a snowstorm or rainstorm, but to be always in the plane so that it would be there when it is needed? You don't say to an oceangoing boat captain, "You carry life preservers, lifebelts, only when you are going so far from land that they have to be a part of it."

Mr. LAWTON. Senator, I think a part of this view should also be based, as we try to base all rules and regulations, upon the experience of the need for this to be carried as an integral part of the equipment. We have had some instances over the years, a few, of such tragedies as you have very clearly mentioned.

But these types of affairs are not a common occurrence.

Senator COTTON. I would almost say to you they were in my section of the country. Where do you live, by the way?

Mr. LAWTON. At present in Maryland, but I have lived in various parts of the United States over a number of years, and as a pilot have flown over and through your fine State, Senator. I am aware that you have had some——

Senator COTTON. In weather.

Mr. LAWTON. Yes, sir, in weather.

Senator COTTON. This is by no means an isolated instance. We just had an accident, it wasn't a case where they couldn't be found for a long time, but we have had a sad accident only a couple of weeks ago with Senator Aiken's son. We frequently have planes go down. This sort of thing can happen. I don't want to argue with you about that one point.

Let me ask you this: has your organization—and again I refer to your suggestions, which I think are very challenging to this committee and should be to General Quesada and his Agency, that you work together and discuss with the Agency and have the opportunity to discuss with the Agency in advance some of the rules to be made—have you suggested to the Agency any specific rules for safety of people who fly in your planes? Have you attempted to suggest any? Have you ever received any intimation that such suggestions would be unwelcome if they were made? Not criticizing rules that were under consideration, although I am sure that you have that privilege, but have you ever suggested rules that ought to be made?

Mr. LAWTON. Yes, Senator, we have, in many areas. Usually they are minor changes, in some cases major changes. As a rule we have received cooperation from CAA and FAA. In talking about bad weather, instrument flying, we had an accident to a busines aircraft, a light twin, at Philipsburg, Pa. This was in the wintertime, about 2 years ago now. There became apparent what we considered a weakness in the procedures under which instrument approaches were being laid out as a pattern by the FAA, and further examination of this with the FAA revealed that in fact they did not consider one rather critical element in an instrument approach. In this particular case—like a pilot I have to use my hands to show you what went on—we have a mountain here. The radio range station, an omni, was located to the east of the station. The instrument approach was predicated upon crossing overhead the omni, proceeding out over the station, and making a procedure turn into the west of this mountain, and then crossing over at least a thousand feet above the highest

projection and then descending down to the radio facility and then continuing to the airport.

Under these peculiar wind conditions on this particular day we had an exceptionally strong wind of 35 to 45 knots, if I recall correctly, from the easterly quadrant, which resulted in a terrific amount of turbulence on the lee or westerly side of this mountain, in which area this pilot was conducting his procedure turn and coming back with the published minimums of crossing over this mountain at about 1,000 feet over its peak.

This is not a normal wind condition. Normally the winds in this area are from the north, which create no tremendous amount or even a light amount of turbulence.

This pilot shot this approach, went through his procedure, and on the west side of the slope encountered severe turbulence to the extent that he was thrown overhead, despite the fact he had a seat belt on. He received severe concussion, but he still managed to maintain some semblance of control of his aircraft. He had with him his employer, his employer's wife and his own wife.

The aircraft, because of the turbulence, plus the effect of the blow on the head, resulted in the fact that we believe the aircraft was literally sucked into the top of this mountain. The pilot survived, fortunately, and his testimony gives credence to this theory.

As a result of this, we immediately went to the then CAA—and this is continued on now through the FAA—to ask them to examine all instrument approaches in mountainous areas where a severe change of wind direction and strength could cause similar turbulence, adversely affecting particularly the light twin aircraft which are now more and more doing instrument flying.

I might add to this, we have been told that this approach has been used by one of the local service airlines. Their pilots, flying this route regularly, are knowledgeable about their terrain, as all good airline captains and pilots are. They knew this condition and habitually requested that their procedures in crossing over the mountain be at a higher altitude and take whatever penalty there was in descending at a slightly steeper angle.

This was where pilot knowledge and familiarity with terrain pays its premium.

We are faced with a great number of itinerant instrument flights where a business pilot may leave and go from one to any number or combination of airports. He does not have the intimate familiarity—and I must emphasize "intimate"—that an airline pilot or one who regularly flies this route would have.

For example, if you were regularly flying on an air carrier between New York and Cleveland, you in short order know, from the fact you do fly VFR even nowadays, the various landmarks. It gets to the point that pilots who habitually use an airport know the prominent landmarks within a radius of 10 or 15 miles of this airport. You know that there is an outdoor theater and there is a road here. And this enables you, during marginal approaches, to orient your aircraft a little more easily without complete reference to the instruments, because you are actually flying under legal visual regulations, but it is pretty sloppy.

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Getting back to our instrument approach procedures, it is a question that, one, they have been largely formulated upon the capabilities and requirements of the air carriers. As a matter of fact the instrument approach procedures now are formulated and approved by the air carrier division under FAA. And by and large they meet the requirements of all aircraft. But in this new and greater use of lighter aircraft under instrument conditions, we felt that this was an area that had not been explored or called to their notice before, and the FAA is doing something about it.

Senator COTTON. You recommended that a rule be made of some kind?

Mr. LAWTON. It doesn't have to be a rule. It is a question of criteria.

Senator COTTON. You recommended that action be taken?

Mr. LAWTON. Yes, sir.

Senator COTTON. Have you recommended that any specific rules be made?

Don't misunderstand me. I don't ask in a critical way. I ask if you have, and if so, what kind of reception you received?

Mr. LAWTON. As to an actual rule, I don't believe this is true, sir. I think if the record will demonstrate we are so busy trying to answer their proposals that we haven't much chance to look at our own needs to propose something.

Senator COTTON. Is that literally true, with an organization of that size? I understand your meaning. But is it literally true that they keep you so busy that you couldn't consider this from the other side, from the constructive side of affirmative suggestions also as well as negative suggestions?

Mr. LAWTON. Senator, we average in one area alone 35 rulemaking cases a week. This is in one area on airspace management. I will be happy to develop this on airspace management. This creates a burden that not only our organization cannot properly handle, but even an organization with the endowments of ATA are not able to handle properly, nor, may I add, do the military, and they have vocally and in writing commented on this to the Administrator.

Senator MONRONEY. Would the Senator yield?

Senator COTTON. Yes.

Senator MONRONEY. Isn't it a fact that on page 8 of your statement, where you detail your efforts to secure a new rule on the carburetor conditions, that that would require a rule change in which——

Mr. LAWTON. Yes, sir. I was going back more into past history, something that Senator Cotton had recognized in this one area.

Senator COTTON. I was about to ask about that, because on this particular accident, about which I was so impressed, the probable cause established was failure of the pilot to use carburetor heat, and also lack of some deicing devices in relation to the motor, not the wings.

I have taken too much time.

Let me ask you this: I noticed in your very good statement about many of your flyers who defer trips, give up trips, who are careful about weather conditions. Do you circularize your people on that subject? It seems pretty obvious, like asking a motorist not to speed, and yet here is an eminent professional man, 60 years old, with mature judgment, years of experience, who apparently gets heedless about

starting off when the weather conditions are bad. Do you, in your publications, or in your circularization of your membership, reiterate and urge caution about weather?

Mr. LAWTON. This gets into a very interesting area of pilot-management relationships. This is not the only one area of pilot-management relationships in which we try to act as a catalyst. We have put out for the consumption and use, and guidance of all companies owning and operating aircraft, a recommended standards manual, in which one section is devoted to the considerations that management must give to a pilot's decision. I think all we can say is that this is something that obviously a company must consider. We realize——

Senator COTTON. I want to be sure I understand you. Do you mean to prevent the president of a corporation, or the superintendent of a division of the corporation, who is awfully anxious to get somewhere for business purposes, putting the pressure on not giving due heed to his pilot's technical decision?

Mr. LAWTON. This is the area in which we bring emphasis. I might point out at this time that a great many companies—and I can cite one in particular, a large oil company with headquarters in Tulsa, that has I believe a plaque inside each of their airplanes which in essence says, the pilot's decision is final; and that at any time should anyone in the company, including the president, challenge this authority, this is immediately reported to the head of their aviation department and a closed session is held with the executive.

I might also point out that we have had no reports of such a closed executive session having to be held.

Senator COTTON. Do your pilots experience difficulties such as suggested by the Senator from California, Mr. Engle, and others in these hearings, and by witnesses, in getting access to and obtaining prompt weather information?

Mr. LAWTON. Yes, sir, we do. This has been for the past three years at least, to my knowledge, one of the constant drives of our organization to improve weather analysis, weather forecast, and more important, the dissemination of all this weather to all pilots, and as a result we have seen the establishment of these 88 low-frequency stations. This is one step.

Senator COTTON. What action has been taken? Did you at that time take this up with the FAA?

Mr. LAWTON. This is more in the province of the Weather Bureau, Senator. We have talked to the FAA because they are responsible for the manufacture of the hardware that goes into the low-frequency range stations.

Senator COTTON. Wait a minute. You say this was more for the Weather Bureau. It was my understanding when we passed this act—and that is why I am not so interested in ocean going traffic and these other things—and gave to FAA powers that you have very well brought out were rather drastic powers and perhaps in some ways were not curtailed as other administrative agencies are checked, that it was done because of the apparent increasing hazards of air traffic, of the conflict and collisions between military and civilian planes, because of air collisions, because of all kinds of hazards and an increase of accidents, and the apprehension of the public. Congress really

went at this and placed in the hands of the FAA powers that reached all over the field.

If you said to the FAA, "People are in danger because of the difficulty of private pilots and business pilots and general aviation pilots, are having difficulty in getting quick, prompt, accurate weather knowledge", that wouldn't be outside the powers of the FAA and that is not confined entirely to the Weather Bureau.

Mr. LAWTON. Not entirely. They have cooperated with the Weather Bureau and improvement has been made, within the budgetary limitations.

Senator MONRONEY. May I interject: The only aviation witness who has ever appeared before the Appropriations Subcommittee dealing with Commerce is Mr. Lawton, who haunts the place almost with each appropriation bill that comes up. He is a most informed man on weather and the most crusading man on weather. Generally, may I say, without being partisan, that he is seeking to override that omnipotent force in this administration called the Bureau of the Budget, and even the FAA cannot issue rulemaking procedures to authorize above ceiling flying in this direction.

Senator COTTON. I am sure, Mr. Chairman, that I appreciate that comment, and it is unnecessary to make it to me because I have been very much impressed by the testimony of Mr. Lawton and I have already complimented him.

I wasn't arguing with Mr. Lawton. I merely wanted to make sure in my own mind, if there was any field—I don't expect FAA to override the budget or the Congress or the President—but if there is any field such as the ability to get the information of the weather, that FAA doesn't have some rather drastic powers, I think we ought to know it. I want to be sure I understand that. They do have the power, don't they?

Mr. LAWTON. They do in certain areas, but it is a cooperative effort. FAA is largely responsible for carrying the weather information on, for example, on their teletype systems.

Senator COTTON. Excuse me. I am disturbed by your statement. This sound like a minor point but I don't think it is a minor point to this committee. You say they do in certain areas, and it is a cooperative project.

If I understood what Congress is trying to do, and to be sure it may well be that it was overdone and that there is too arbitrary power, and I am not going to get into an argument on this point either with you or my friends on the committee, because it may well be so—but if there was a mistake, and if too great power is given FAA, it was given because Congress and the public at the time this law was passed were desperate about air safety.

If there is anything, it would seem to me as a layman who has never flown a plane, if there is anything that is necessary for your people it is to be able to take the telephone and find out in a reasonable time what weather conditions are.

It seems to me that that is one of the fundamental things. And if FAA hasn't got the power to see to it that that is a fact, if all they can do is urge the Weather Bureau or suggest to them that they provide some special service, or suggest to somebody else, or if it is a cooperative effort, or it is a matter of cooperation or something they can't put

their foot on, I think this committee should know it. We should clarify that very, very carefully.

Mr. LAWTON. I think if you will refer to the provisions of the present act—I don't have a copy of it here—there is one special section which delineates the joint responsibilities and cooperation between the Weather Bureau and the FAA.

I think that reference to that will indicate the provisions of the act. There are some areas possibly in which further emphasis could be given by FAA. For example, in the matter of direct pilot forecast, or frequencies. FAA could urge that. Exactly how the direct action would be taken either by FAA or the Weather Bureau to me at this moment is not clear.

Senator COTTON. I have before me section 803, which was carried over from the old act. You may be entirely correct that because it was carried over from the old act it doesn't confer upon the FAA any new powers that the CAA didn't have before it, and that was a matter of cooperation. If that is true, Mr. Chairman, I think we have discovered something that this committee ought to consider very carefully. While I am sure it is not any fault of the Weather Bureau—and they testified very well yesterday, indicating what they do about it, such as unlisted numbers for the use of aviators—if we create an agency and give it power even over the military, and then inadvertently keep the Weather Bureau sacrosanct and the pilot can't get the service, that is something we ought to do something about.

Senator MONRONEY. May I say the Weather Bureau is confronted with the same problem the Civil Aeronautics had, and that is that it is a subagency within the Department of Commerce. They can propose budgetary requirements, but it finally filters down to the budget officers of the Commerce Department. This is one of the prime reasons that something had to be done to give FAA individual status.

Suggestions that the new Aviation Agency be given the power to disseminate this weather information after it was gathered by the Weather Bureau, with their technicians and meteorologists, met a resounding "No" from the administration. At present they are doing the best they can, I believe, and General Quesada has testified, as Mr. Reichelderfer did, that we receive the frequent drops from the service which is a communications network maintained by the Weather Bureau, and that the FAA, with its own funds, tried to supplement the dissemination through reaching more control towers and more weather stations and more range stations, which was being done.

It is not perfect, but under the setup in which we work it probably is a lot better than it was before the FAA was able to coordinate military weather information and military observations and reporting points and bring it into one network, from which then the basic weather nationwide or worldwide can be funneled in for aviation uses.

There is a long ways to go yet, and certainly Mr. Lawton will be appearing every hour on the hour when there is money involved, for better weather.

Senator COTTON. I am compelled to observe that I doubt if a resounding "No" from the administration has any more effect on the

distinguished chairman of this committee than it does on me as a member of the minority and the same part of the administration, and it leaves me cold. I don't believe it will mean much to the chairman of this committee if we are convinced that some more power ought to go to somebody on this matter of being able to make available promptly weather knowledge.

Senator MONRONEY. This will be a matter of appropriations, primarily, and it has been a subject in which the chairman, with the great help of Mr. Lawton, has been consistently appealing for more appropriations to implement this very thing the distinguished Senator points out is so badly needed.

Senator COTTON. The Senator from Oklahoma is in a position to do a lot on that.

Senator MONRONEY. I deeply appreciate your very valued help which will be far more effective on one side of the aisle than mine.

On page 3 of your statement you point out that in 1958 heavier corporate aircraft suffered two fatal accidents in which seven persons were killed. And the lighter corporate aircraft, 6 fatal accidents in which there were 9 passenger fatalities, and in the personally flown business aircraft there were 42 aircraft accidents with 69 fatalities. This makes a total of 50 fatal accidents in which 58 passengers were killed, and perhaps a part of this number was crew including the individually piloted aircraft.

Would you say that weather was a causal factor in a large portion of these?

Mr. LAWTON. I believe that is the correct observation, Senator, particularly in reviewing my memory, the two accidents in 1958, one was very well publicized, which involved Mike Todd. Weather was a contributory factor, but not a determining factor, I don't believe, in this accident, as the CAB analyzed it.

Senator MONRONEY. His plane iced up, however, over New Mexico, as I recall.

Mr. LAWTON. That is correct. There was a combination of things, starting from CAB's belief that the plane may have overloaded at the time of takeoff. The pilot was trying to climb, the CAB believes, above proper cruising altitude, in view of possible single-engine operation. The aircraft did have an engine failure and at that altitude under those weather conditions spun in and killed the two crew members and the two passengers.

Senator MONRONEY. With proper weather information he could have flown around this icing condition, could he not have, had he been advised of it or known of it?

Mr. LAWTON. I think, under these circumstances, Senator, that it was revealed that the weather information was available to the pilot, and that because it was available to him, when he started to encounter icing he started his climb to what was a clear level, and it was during the course of this climb in which he advanced his engine power, because his airplane had already received a substantial weight increment from ice forming on the airplane, that about the time he reached the clear level one engine failed; and at this altitude the other engine was not able to sustain the aircraft with the additional load of ice which was on the airplane; and things just went from bad to worse from then on.

In this type of operation, which is being conducted over routes that are commonly used by the airlines, it is our feeling that the pilot had adequate weather information in which to plan his flight, and he reacted accordingly.

Senator MONRONEY. He could have taken another route if the icing conditions were forecast which would have kept him from climbing to a higher altitude.

Mr. LAWTON. I am not familiar with the current weather situation.

Senator MONRONEY. My understanding of the terrain that he took a shortcut across dangerous mountains.

Mr. LAWTON. He was on a regular civil airway.

Senator MONRONEY. This was a regular airway, but he still had the choice of two or three other airways that could have provided a circuitous route, further south, which probably would have taken him out of those icing conditions.

Mr. LAWTON. This is possible; yes, sir.

Senator MONRONEY. In other words, this is not a typical example, as I reconstruct the crash, of a normal business aircraft operation.

Mr. LAWTON. We hope not.

Senator MONRONEY. This was more or less of a lease deal with a fixed base operation?

Mr. LAWTON. Yes, sir, but the pilots in the aircraft were fully competent and well certificated in all regards. This is a combination of circumstances that added into a fatal accident, which they do in many other types of flying.

Senator MONRONEY. The other fatal accident of the heavier corporate aircraft, was weather connected with that, too?

Mr. LAWTON. Yes, sir, the second one in 1958 was referred to in more detail later on, and was the accident at Woonsocket, R.I.

Senator MONRONEY. I thought that was in 1959?

Mr. LAWTON. No, sir. That was December 15, 1958.

Senator MONRONEY. That is the one we are going to have a further report on.

Mr. LAWTON. This is the one that was included in my written testimony.

Senator MONRONEY. When Mr. Bakke comes back in open hearings, we want to go into that. Weather was a very heavy incident in that, both as to icing conditions and perhaps the failure of the after carburetor heat to keep the carburetor free from icing.

Mr. LAWTON. Even more basic than that, Senator. Talking on weather problems, the reason that this pilot flew into this weather was the fact that the Weather Bureau did not have the facilities to observe the movement and rapid deepening of a low off the Atlantic Coast, and this was not too far offshore. As a result of the rapid deepening and the northerly movement of the low, a vast amount of very moist air was fed into cold temperatures. This was not forecast and as a result of this the pilot encountered this without knowing what actually the conditions were. They certainly weren't forecast.

He applied proper techniques to provide heat to his engines to the best of his ability and with regard to all professional knowledge. But because the aircraft, in our opinion, and as indicated by the Civil Aeronautics Board, did not in actuality have sufficient carburetor heat rise, the pilot lost one engine, and then lost the second engine, and as a result the airplane crashed.

This was called, as we stated, to the FAA's attention. They in effect did nothing about it except to say that our standards are all right; the pilot doesn't know how to use this.

Knowing the pilot and knowing the airplane, the company and our association immediately went to the Civil Aeronautics Board and we presented the factual evidence regarding the heat rise on this particular airplane engine combination. We provided an aircraft for them to test fly. The manufacturer participated in this. We came out with the same conclusions as the Board did in their recommendation to the FAA, that your standards are not suitable, they are not safe.

I think the CAB was entirely responsive, and I should say that I feel that the FAA was not. This condition continues to exits. We have warned our operators of the existence of this particular icing problem and they are taking steps to use other techniques, and the manufacturer is developing a more satisfactory heat rise component. I believe, in the long run, we will get effective standards for the aircraft from FAA.

Senator MONRONEY. The weather matter, on page 7 of the report of September 11, 1959, on this accident:

The pilot was misled by the inaccurate weather forecast and briefing which he received prior to departure. The nature of this weather service was such that it would have led to a false sense of security and no mention was made of anticipated adverse weather of any kind en route.

Mr. LAWTON. What page are you referring to?

Senator MONRONEY. This is from the CAB's accident report on that, which verifies what you have said. My understanding is that the pilot's briefing was by a private weather service rather than the Government. National Weather Forecasting Corp.

Mr. LAWTON. May I comment at this point on this? This also—and I must point out that the Civil Aeronautics Board in our estimation, in this accident report was not accurate. The fact that they cited that the National Weather Forecasting Co. provided the briefing is true. National Weather Forecasting made their forecast on the basis of information received from the Weather Bureau. The information received from the Weather Bureau did not indicate this condition of a deepening low off the Atlantic Coast. They made the same type of forecast with some modifications, indicating a little bit more critical situation as far as terminals went, than did the Weather Bureau. But no one detected—and this is the Weather Bureau's province—this condition that was rapidly developing and into which the pilot subsequently flew.

To put an onus on this private weather forecasting group was not, in our opinion, entirely necessary or true.

Senator MONRONEY. Do you feel, since this was a weather condition that was originating over water, that we have adequate reporting facilities perhaps in weather observation ships offshore to give us the fill-in of vacant spots which we cannot cover adequately by land?

Mr. LAWTON. I think the answer must be obviously "No."

Senator MONRONEY. Can you do it by long-range weather radar?

Mr. LAWTON. This I don't have the technical knowledge on, Senator, but I believe that a great amount of this basic information might have been obtained through a more efficient system of relaying pilot reports

and ship reports in the area. This is one notable deficiency in the translation of present information which the FAA receives and sometimes transmits to the Weather Bureau—and this is a contention upon their weather capability—but these reports come from air carrier, military, and private business pilots. A great majority of this information never gets properly disseminated.

Senator MONRONEY. Would it not be imperative if the FAA received what they believe to be reliable reports of heavy ice, from a transport aircraft or commercial airline flying through it, to put out a flash advisory for other planes in that area?

Mr. LAWTON. This is being worked on and being developed by the Weather Bureau. We might add in this a point that may be of interest to you, Senator, to know that our concern on weather is also shared to some degree by the air carriers.

We have had excellent cooperation from some of the air carriers, one in particular, on this subject, where United Air Lines has a system of hourly weather broadcasts on company frequencies, which give a brief but very informative manner the terminal weather, the trends at the various terminals along United's routes, it gives severe weather warnings, it gives icing conditions, and things that are germane and pertinent, life and death information to a pilot.

Senator MONRONEY. The immediacy of the weather can change from minute to minute.

Mr. LAWTON. That is correct. United Air Lines has given us the information, and the charts which they use on their regularly scheduled air carriers, and we have sent this to all of our members so that each of our aircraft contain this information and know how to use it. We have received increasing cooperation from United in particular, and from other air carriers in this common problem of cooperation, of using their facilities which we can tune in on or be advised of.

This is one of the most heartening development in the area of cooperation between general aviation as a whole and the air carriers. We hope and pray that this enlightened attitude will extend to more and more air carriers.

Senator MONRONEY. Getting back to the total of some 84 casualties and 50 accidents, would you say with particular reference to the 42 fatal accidents with a total of 69 fatalities with the personally flown business aircraft, that that had a heavy incidence of weather causation?

Mr. LAWTON. I believe the record will sustain that observation.

Senator MONRONEY. Roughly what percentage of the accidents would you estimate—involving the aircraft to which you refer—is connected to weather?

Mr. LAWTON. Weather is related I believe to all but possibly one or two. The degree varies.

Senator MONRONEY. In other words, there was a weather causation that, had there been good weather, certain mechanical failures or other things would have brought the plane down safely?

Mr. LAWTON. Yes, sir.

Senator MONRONEY. Thank you very much. We compliment you again on your statement and on your great and continuing interest

in more adequate and more frequent and more available weather reporting for aviation safety.

We will continue the hearings at 2 o'clock, at which time we will have as the principal witness Mr. Joseph P. Hartranft, president, Aircraft Owners and Pilots Association, Mr. A. B. McMullen, executive director, National Association of State Aviation Officials, and Mr. Laudenslager, eastern vice president, National Aviation Trades Association.

We will try, if possible, to complete the hearing of all four of these witnesses this afternoon, at which time we will probably adjourn until Tuesday morning.

The committee will stand in recess until 2 o'clock.

(Thereupon, at 12:05 p.m., the subcommittee was recessed, to reconvene at 2 p.m., the same day.)

AFTERNOON SESSION

Senator MONRONEY. The subcommittee will resume its hearings.

We are honored today to have the head of one of the great aviation organizations and associations, Mr. Joseph B. Hartranft, president of the Aircraft Owners and Pilots Association; one of the largest of all the aviation organizations, which has been helpful to this committee on many subjects and for many years.

We welcome you to this hearing and we will appreciate any contribution that you might have to make in our efforts to find ways and means of improving air safety and general improvement of our aviation activities.

STATEMENT OF JOSEPH B. HARTRANFT, JR., PRESIDENT, AIRCRAFT OWNERS & PILOTS ASSOCIATION; ACCOMPANIED BY C. C. THOMPSON, MAX KARANT, VICTOR J. KAYNE, MERRILL ARMOUR, AND REAR ADM. ROBERT G. ARMSTRONG

Mr. HARTRANFT. Thank you, Mr. Chairman.

I would first like to say that I want the committee to see some of the staff of a real, live, genuine special-interest group in the flesh. I ask your kind indulgence while I identify them, as they will, from time to time during this hearing, be called upon to testify, more specially in the specialized subjects to be covered in the later hearings.

On my left, your right, Mr. Chairman, Mr. Cyril C. Thompson, our specialist on airport matters. He is sort of our dean of our policy group; a former secretary of the Airport Operators Council, special consultant to CAA Administrator Lee; on matters relating to the Federal Airport Act, and a former vice president of United Airlines.

In back of me, and I will ask the gentleman to rise for identification—Mr. Ralph Nelson, our pilot service specialist, formerly a staff flight instructor at the Institute of Aviation of the University of Illinois.

Also in the audience, Mr. Charles Logsden, our specialist on international air activities, and leading U.S. expert on the establishment of civil and military national and international air records.

Mr. Logsden only recently returned from the Edwards Air Force Base where he had certain responsibilities concerning the qualifications of the F–105 on the closed circuit world speed record.

To my immediate left, your right, our vice president, Mr. Max Karant, former newspaperman, 11 years managing editor of Flying magazine, editor of the AOPA Pilot magazine. While these all seem to be editorial qualifiactions, Mr. Karant has known and evaluated some 57 different types of civil aircraft, as an instrument pilot, and a very active pilot, I might say. He just delivered one airplane, a small twin, over in Europe, and he leaves at the conclusion of the hearing today into the Caribbean with a new type twin-engine aircraft.

To my right, Mr. Victor Kayne, our air traffic control specialist, one of the primary founders of our present air traffic control system, formerly chief of the Washington-Hoover and Washington-National Airport control towers, later Assistant Chief of the CAA Airways Operations Division.

And to his right, Merrill Armor, our Washington counsel, former Assistant General Counsel and Assistant Chief Examiner of the Civil Aeronautics Board. Prior to that, Chief of the Oil and Gas Unit of the SEC.

Back at the activity reporting table performing his function, Mr. Charles Miller, our managing editor of the Pilot magazine, a former newspaperman, and a member of the press service of the U.S. Information Agency.

And on the end of the table, Robert Armstrong, rear admiral, U.S. Navy, retired, and for 30 years a naval aviator, formerly the civil aviation liasion officer for the Chief of Naval Operations. He is our air specialist on airspace matters.

All but two of this group, who are a partial portion of the AOPA policy staff, are pilots, Mr. Chairman.

As I have previously had the privilege of appearing before this committee on several previous occasions, I believe most of the members are well acquainted with the nature of services provided by our 70-man staff for civil aircraft pilots. A summary of my personal qualifications appears on the last page of this testimony.

Since appearing before this committee a little over a year ago, to testify on the then pending Senate bill 3880, my organization has had further expansion of its pilot membership by 10,000 additional members so that, in presenting this testimony, I do so as spokesman for more than 80,000 qualified and active civilian pilots who own and fly approximately 56,000 aircraft of all types. This is better than 56 percent of the total general aviation fleet in the United States.

You may be interested to know that today the general aviation fleet comprises 96.2 percent of the country's total civil aircraft; the airlines—both domestic and U.S.-international—operate 1.8 percent. General aviation aircraft carry more people than the airlines, fly more hours each year, and use 100 percent of the country's civil airports—the airlines use less than 10 percent.

On the basis of the foregoing, we feel that the consolidated opinions which emanate from our group are of major importance. The material herewith is not gleaned from sample surveys or token opinions projected into theoretical totals. The registered pilots of Aircraft

Owners & Pilots Association, in short, are the substantial users of the airspace and the majority interest of general aviation.

One further point before proceeding: In spite of our best efforts at public education, there is still widespread opinion on the part of the lay public, and a surprising number of aviation-informed public officials, that the general aviation fleet is comprised essentially of light plane "putt-putts", whilst the multiengined equipment is solely the representative image of airline-type operations. This false impression of "sport flying" in "light planes" frequently derogates serious consideration of general aviation and the proper solution of technical or operational problems involving transportation by personal and business aircraft.

Bear in mind, gentlemen, that only 9.8 percent of the total civil air fleet, including airlines, is comprised of multiengined equipment—in round figures 10,000 airplanes. Of these 10,000 multiengined airplanes, 77.9 percent are in the general aviation fleet, operated by private individuals and business firms; 17 percent are operated by the airlines. An additional 5.1 percent are oprated by miscellaneous categories, including Federal and State governmental agencies.

Essentially, the hearings conducted by this committee, as I understand them, relate to an evaluation of the progress or lack of progress, the good points and the bad points, which have resulted from administration of the Federal Aviation Act of 1958; and act largely conceived under the guiding eyes of this committee.

As with any piece of legislation which endeavors to regulate people, it is expected that some inevitably will press objections simply as a reaction against regulation. If there have been situations or occasions in which groups or even individuals have been unjustly subjected to hardship, or deprived of their rights without due process, or are in any way the bona fide victims of an improper system or a faulty regulation, than their expressions would also be expected.

It is sometimes not easy to differentiate between the two; the individual who is simply a nonconformist and who emulates the rugged individualism—for which many great Americans have become famous—and the person who has a true victimization, if you want to put it that way, of a faulty or an oppressive system of government. I am sure however, that the members of this committee are abundantly qualified and will, with the assistance of their able staff, be able to separate the wheat from the chaff. I do hope this can be done swiftly to bring into being the necessary repair work to those portions of the Federal Aviation Act passed in the last Congress which, on the evidence, are shown to be worthy of this attention.

There is indeed no discredit to anyone that a measure as comprehensive as the Federal Aviation Act of 1958 should need some adjustment and repair. It would have been expecting the impossible to have asserted that any legislation of this magnitude could have been perfect on the first try. It is a tribute to your leadership, Senator Monroney, and to the keen wisdom of your committee members—and I might add to their infinite patience and endurance—as witness these hearings—that the Federal Aviation Act of 1958 has weathered its initial months of operation in a manner as to reveal relatively so few imperfections among its many and complicated provisions.

In paying such tribute, I am confident that we, the users of the nation's airspace, are in competent hands and that the same inspirational architecture which went into the drafting of the original act will now be carried into the efforts of projecting and clarifying this monumental undertaking.

Essentially, we have three general areas which we believe merit the attention of this committee. We believe the problems involved will require several clarifying amendments to the existing act. These will be indicated, along with the justification, as we progress with our testimony.

One further generalization is in order. It is a point difficult to make clear in the written word, but it is essential to dispose of it in the beginning to prevent misunderstanding. I should like to go directly to that point and state our position as clearly as I know how.

I refer to the administrative staffing of the office of FAA Administrator. And more specifically, to the initial direction given to the Federal Aviation Agency by its first Administrator, Elwood R. Quesada.

It is inevitable in any upheaval of Government functioning that the individual who occupies its chief administrative post, however well qualified, inherently becomes the symbol of the function and therefore, the target of criticism. This is often unfortunate and sometimes unjust, since it is many times difficult to distinguish between the merits or the weaknesses of a Government agency and the administrative activities of the individual responsible.

Given a condition of a strongly restrictive congressonal act—one which creates new concepts of regulatory authority and reverses old concepts of individual rights—and adding to this a strong, vigorous Administrator, there is inevitably created an explosive mixture which is certain to precipitate public discussion.

Mr. Quesada is a strong and vigorous Administrator.

You gentlemen are old hands at the difficult and demanding task of dealing with controversial issues and public pressures. Most of you have gained this deftness and skill through long years of experience. Indeed, masterful accomplishment of this acumen is a badge of any successful political office. When accomplished, it is also a comforting essential for any public servant occupying a high position of responsibility in an appointive agency of the government.

I can very much sympathize with the difficult adjustment which would involve one who is accustomed to military precision, unquestioned vertical chains of military command and accountability, and the relative haven from public censure which is usually inherent and perhaps necessary in the whole scheme of military administration. Mr. Quesada's distinguished military service record is evidential proof of his stature and accomplishment within this realm.

I sincerely believe that Mr. Quesada entered the Office of FAA Administrator with the same determination which characterized his previous military accomplishments: to do the job he thought expected of him and to carry out his understanding of the mandate of Congress and the requirements of the Federal Aviation Act. That he has pressed this with all of his vigor there can be no doubt.

I for one do not question the personal sincerity with which he has pursued this arduous undertaking. Nor do I question the considerable effort which he has put forth to be impartial in his decisions.

If we have any quarrel with the results—and we do—it is my contention that the quarrel is essentially one directed against the weaknesses of the basic legislation and not against the individual who was chosen to carry out its terms and conditions. This is not to say that there have been no instances of error. There have been errors as with any individual with administrative responsibilities. But I believe Mr. Quesada has made a clean breast of the errors of which he has had knowledge, and that he will benefit from such experience.

There have been instances of dispute in matters of interpretation of the act where we in the industry have felt that those to whom Mr. Quesada delegated policy and decision were wrong. Any agency head is, of course, accountable for the actions of his deputies. This too, is not abnormal, and I think many of us in industry have occasionally been wrong in improperly identifying the object of our differences, oftentimes substituting the symbol of Mr. Quesada's aggressive leadership as our object of criticisms when the basic difference really was with the provisions of the act he was dedicated to administer.

It is not unlike the efficient tax collector upon whom so many vent their spleen. The tax collector unfortunately is never a likely candidate for a popularity contest. In many respects, Mr. Quesada's position is similar, and I hope he has the faculty for adopting a philosophy concerning these matters which will permit him to rationalize and accept these uninvited but inevitable fruits of public service and understand and assist in correcting the basic act to eliminate inequities and injustices. This is difficult and requires frequent soul searching.

Further. I believe Mr. Quesada's vigorous defense of the present method of operation of his agency, and the Federal Aviation Act in its present form, is well described by Alexander Hamilton:

> Nothing is more natural to men in office than to look with peculiar deference towards that authority to which they owe their official existence.

The foregoing part of our statement regarding Mr. Quesada was prepared prior to hearing the rather electrifying denunciation by inference of the 40 organizations comprising the aviation industry in his basic testimony of January 12.

I am not sure that we should dignify this sweeping and unexpected tarring—but to leave judgment to your able and fair determination following conclusion of these hearings, and in deference to the dignity of his office and my high personal regard for Mr. Quesada, I would not alter my stated opinion regarding the office of the FAA Administrator.

One point we should be entitled to make responsive to the statement placed on the record by Mr. Quesada on January 12. While he has identified an entire industry as irresponsible and pressure prone—presumably when they have the temerity of opposing what they sincerely consider to be an intemperate, unjustified, or just plain defective regulation—he singled and identified our organization for his unfounded accusations.

By introducing into the record the December and January issues of the AOPA Pilot magazine, the official magazine of my organization and incidentally, the second largest aviation periodical in the United States, he has specifically directed his attack.

I do wish to point out that, after naming us specifically in this manner, he proceeds to state examples of noncooperation which are totally unrelated to our activities, our members, and our association. I understand Mr. Sayen and others are to appear before the committee. They will have whatever facts they wish to present. This is not a part of our order.

These editorials in the December and January issues of the AOPA Pilot call for a system of checks and balances as the necessary alternative to a system which could potentially lead to a dependence upon the infallibility of one man, the FAA Administrator, whoever he might be.

We do not embrace the doctrine of infallibility of the Administrator; we do not embrace the theory that the king can do no wrong; we do not believe in these archaic doctrines—and neither did our Founding Fathers. These are totally foreign to our democratic system of government whether we are regulating the commerce of the sea, land commerce, or commerce of the air.

If the upholding of the doctrine—expressed in our Constitution—of the separation of powers, if in trying to apply the American system of checks and balances to the operation of the Federal Aviation Agency, we are engaging in "pure invective and intemperate attack," then we are proudly guilty as charged and, with the same firmness expressed by Mr. Quesada, we pronounce our complete dedication in behalf of our constituency—and I think of all true Americans—to the continuation of our traditional American form of jurisprudence and our beloved system of checks and balances.

Lest this term "pressure group", so cunningly used, be permitted a power to deceive or tar and feather by innuendo, I should like to read from the corporate charter of the Aircraft Owners & Pilots Association the purposes for which the efforts of its officers and members are dedicated:

> To promote, protect, and represent the interests of the members; to further the art, science, and industry of aeronautics and the pursuit of flying; to promote the economy, safety, and popularity of flight in aircraft and the use of aircraft, including the pilotage thereof, and to enjoy and exercise such other further purposes and powers as are specifically granted to it by the laws of the State of New Jersey, not for pecuniary profit.

Mr. Quesada has said that dissatisfaction with his agency is being created by a "hard core" through editorials and other activities. He was trying, by his presentation before this committee, to discredit in advance the spokesmen of these groups in the eyes of their members. This tactic of divide and conquer is one of the oldest maneuvers of mankind.

Legitimate comment on the conduct of a public official or a public agency by the press is a basic fundamental right of Americans, dating back to Peter Zinger, and Tom Paine. Is Mr. Quesada trying to gag the press? This brings me back to the question of intimidation: Who is intimidating whom?

We naturally hold our principles and ethics high. Our organization's motto has always been vigilance, integrity, and progress. In the 20 years that I have represented my association—and this period covers a span of some 10 Administrators—we have never been subjected to a public charge of this kind. Traditionally, our organization has been a militant leader in the development of civil aviation—and there is no question about the overwhelming allegiance of our pilot members.

Our 80,000 members are individual constituents of the various Members of this Congress. Many of these members have offered their services to represent our interests in the different cities where the FAA has air traffic control committees.

These include many leaders in their communities. In one case, it is the State director of aeronautics; in another, a member of the city council of one of our major cities; in other cities we find such individuals as corporate presidents, leading attorneys, and even one vice president of a bank. These busy men donate their valuable time in the interest of encouraging and protecting general aviation. Would such numbers of responsible citizens long follow irresponsible leadership?

Our membership renewal rate is well above 85 percent each year, almost unprecedented in the annals of trade or professional associations.

Mr. Chairman, I am frankly puzzled as to the connotation Mr. Quesada attached to his use of the term "pressure group." If we are a pressure group, we apparently are in some good company, for this committee has heard the military so classified by Mr. Quesada.

By Mr. Quesada's definition, the American Medical Association could be considered a pressure group. We know that the American Medical Association is a very responsible group representing the medical profession in much the same manner as AOPA represents aircraft owners and pilots.

Apparently, the FAA thinks so too, because in their testimony before this committee, they put almost total reliance upon the alleged recommendation of the American Medical Association in support of their proposed regulation to eliminate family physicians from the list of those qualified to give third-class medical examinations. The only inference I can draw, Mr. Chairman, is that a pressure group is desirable so long as it favors the Government's position on a given matter, but automatically becomes irresponsible if it is opposed to the official position.

Under this conception the Boston Tea Party, Green Mountain boys, and minutemen would be cataloged as irresponsible.

I was tremendously pleased to hear Senator Morton say that we users of the airspace have a built-in appeal to Congress. We hope we are not identified as a pressure group—the irresponsible kind, that is—for bringing these problems to you today. We also hope that the required repairs can be made to the Federal Aviation Act to make the use of this avenue of appeal unnecessary in the future.

I assure you, Mr. Chairman, that we will try throughout our testimony to cite not generalities, but specific, documented evidence of the type of faults inherent in the act under review.

Essentially, what has gone wrong, we repeat, results from the elimination of a system of checks and balances in the process of rule-

making, enforcement of rulemaking, and the administering of penalties for those who stand accused.

In its simplest form we may say that, previously, these checks and balances existed by virtue of the rights of appeal through the Civil Aeronautics Board, the availability of adversary proceedings which characterized the public hearings formerly permitted, and the clear separation of rulemaking, investigative, and enforcement procedures.

This was the very essence of our testimony in 1958, which was shared by most organizations appearing before you, but the doctrine of expediency proved all powerful.

Again, we must go back to very basic things.

Many men throughout history have seen the grave dangers of which I speak. To quote a few:

James Madison:

> The accumulation of all powers, legislative, executive, and judiciary, in the same hands, whether of one, a few, or many, and whether hereditary, self-appointed, or elective, may justly be pronounced the very definition of "tyranny."

Rufus King, one of the framers of the Constitution:

> * * * The judges ought to be able to expound the law as it should come before them, free from the bias of having participated in its formation.

Montesquieu, Baron de la Brede et de Montesquieu, famed world authority on jurisprudence, and I think this hits it right on the head:

> When the legislative and executive powers are united in the same person or body, there can be no liberty, because apprehensions may arise lest the same monarch or senate should enact tyrannical laws to execute them in a tyrannical manner—

Listen to this—

> Were the power of judging joined with the legislative, the life and liberty of the subjects would be exposed to arbitrary control—

for the judge would then be the legislator.

> Were it joined to the executive power, the judge might behave with all the violence of an oppressor.

This latter, I believe, describes the basic FAA shortcoming with which we are most concerned, far better than could I.

Any discussion of aviation safety during 1959 must be based on facts available to us. In broad and general terms, general aviation's fatal accident rate rose slightly from 3.3 fatalities per 100,000 hours flown in 1958, to 3.5 in 1959.

In my opinion, the FAA's first year of existence had no particular bearing on the general aviation accident rate one way or another, because the FAA's widely publicized activities in the field of aviation safety did not deal with any of the major factors that cause the majority of general aviation accidents.

The record of this hearing has figures indicating a comparison of the total fatalities in general aviation as compared to the total fatalities in airline operation showing numerically higher totals for general aviation than the airlines.

As stated, they are subject to gross misinterpretation as they bear no relationship to the total number of aircraft involved. While airline aircraft on the average accommodate a greater number of seats, this valuation is relatively insignificant when considered against the

fact that general aviation operates 96.2 percent of the total aircraft as against 1.8 percent of airline aircraft.

The FAA Statistical Handbook of 1959 presents in terms of plane miles flown per fatality comparative figures which present the true nature of the accident trend in general aviation. Evidently, 1959 figures were not available at the time of publication, but the following is most revealing of a greatly improved accident record for general aviation.

1934—Fatalities, 323. Plane miles flown per fatality	234,062
1948—Fatalities, 1,384. Plane miles flown per fatality	1,061,806
1957—Fatalities, 801. Plane miles flown per fatality	1,780,630
1958—Fatalities, 688. Plane miles flown per fatality	2,244,186

Source: FAA Statistical Handbook 1959, p. 130.

I point out, Mr. Chairman, that from 1934, when we had 234,062 plane miles flown per fatality, at the end of 1958 we had a phenomenal improvement when the figure was 2,244,186 plane miles flown per fatality.

To be specific, the greatest single enemy the nonprofessional pilot faces is the weather. The average man who flies—and he comprises the great majority of all the country's 300,000-plus actively certificated civil pilots today—is constantly plagued by either a lack of weather information, or by being misled into dangerous conditions by inadequate weather information. Let it suffice here to say that weather is at the top of the list of killers in general aviation and therefore it offers the greatest potential for increased safety.

You already have heard Dr. Reichelderfer describe the steps that he considers necessary to correct this situation. We wholeheartedly support his recommendations and add only the plea that we need more of everything in the weather field.

I have dealt only with one very important cause of considerable numbers of general aviation accidents. There are many others, all of which should be attacked by the FAA immediately and aggressively but on a factual basis. The lack of factual justification for its proposals has caused a large amount of criticism of FAA.

The files of the Federal Aviation Agency contain many safety recommendations that have been made by AOPA over the past months. These are not objections to rulemaking; these are suggestions of our association. Included in these are the following:

1. Cockpit visibility standards for all aircraft.

2. A speed limit of 180 m.p.h. for all aircraft operating below 2,000 feet.

3. A speed limit of 350 m.p.h. for all aircraft operating below 15,000 feet.

4. Restrict rates of climb and descent below 3,000 feet in all control zones around civil airports to a maximum of 1,000 feet per minute.

Please note, gentlemen, we want these regulations to apply to everybody, including ourselves.

5. Require flight recorders in all aircraft designed to operate at more than 300 m.p.h.

6. Require a collision warning device in all aircraft designed to operate at more than 300 m.p.h.

7. Prohibit normal use of civil airports by military aircraft having flight characteristics equal to or greater than the Century series.

8. Confine jet training to restricted areas or remote areas removed from civil airways and populated areas.

9. Confine jet penetrations and high-speed climbs to defined corridors or provide radar surveillance to protect other traffic.

10. Prohibit military formation flying outside of restricted areas or below 15,000 feet.

11. Prohibit "fighter break" approaches to any joint-use airport.

If desired, Mr. Chairman, we can make available to this committee copies of correspondence containing these safety recommendations.

Senator MONRONEY. I don't think that will be necessary, unless there is something in the correspondence you think would be more fully explanatory. I think these are quite explanatory in the way you have set them out.

Mr. HARTRANFT. Mr. Chairman, I would only submit them if the committee had doubt, as I understand the previous testimony may have suggested, that organizations comprising these "pressure groups"—and I use it within quotations—were not interested in safety and were not themselves developing safety programs and asking for safety which applied to themselves as well as to other components of the aviation fraternity.

Senator MONRONEY. So far as the chairman is concerned, I have no doubt about your having submitted these and I am sure the other members concur.

Mr. HARTRANFT. Thank you.

With a few minor exceptions, these recommendations have not been implemented by the Federal Aviation Agency. I would like to pause there. With a few minor exceptions, these recommendations have not been implemented by the Federal Aviation Agency.

The airplane itself can be improved in a number of ways, though little or nothing has been done about this. The FAA issues a Federal certificate for each airplane and has wide latitude in the level of safety it can demand.

A case in point: We had been having trouble for years with the fact that a lot of pilots get terribly careless when it comes to watching where they are going. We also knew, however, that pilots in many types of airplanes who were well aware of this hazard, and did their level best to watch out for other airplanes, could not do so anyway, simply because they could not see out of their cockpits. This was particularly true with a number of airline aircraft, as well as with some general aviation types.

AOPA strongly and repeatedly recommended that reasonable and safe minimum requirements for cockpit visibility be established. You remember my plea for this, Mr. Chairman, 18 months ago, before this committee. You probably remember me saying it 3 years ago before this same committee. We haven't got any more today than we had when we first brought it to the committee's attention.

We recommended this not only for airline aircraft; we asked that our own aircraft be treated the same way. The hazard was particularly aggravated in certain airline aircraft, and in those few cases, we recommended the CAA and FAA take forceful action and order any such aircraft continuing to fly in the airspace where others might be hit by them, to have their cockpits modified to meet those standards.

AOPA has been recommending this repeatedly for years. As of this moment, there is no such firm, unequivocal requirement.

One of the more disturbing aspects of this whole safety matter, so far as the FAA is concerned, is the sharp contrast between their repeated protestations to the effect that safety is always uppermost in their minds, and what they actually do about specific hazards called to their attention. Weather, stall-spin, ground-accident, and cockpit visibility hazards have been well known to FAA and CAA officials for many years, yet little or nothing has been done to reduce them. There are others. Let me give you a specific instance.

Not long ago we received a press release boasting about a flight that had been made in September by a Convair B–58 supersonic bomber. The flight had been from Fort Worth to Edwards Air Force Base in California. According to the announcement, it was made at altitudes between 300 and 500 feet above the ground—at an average speed of 700 miles per hour.

Having spent many months over the past several years participating in innumerable and interminable meetings, hearings, and forums dealing with the terrible hazards present even when such aircraft cruise at their normal altitudes over 30,000 feet, we asked the FAA Administrator, with some dismay, if he regarded such flying, in airspace heavily used by many thousands of aircraft each day, as being safe.

We received a long reply pointing out that (1) this was an Air Force project "in the interest of national defense," (2) was routed in such a way as to avoid flying on airways—actually, the flight crossed 33 airways, and (3) was routed so as to avoid violating part 60.17 of the civil air regulations. This rule merely says that a plane should not fly over a community or concentration of people below 1,000 feet. Nowhere was there any expression of concern over the extreme hazard such a flight presented to other aircraft, either through an actual collision, or by the violent wake left behind such a plane—a wake that could literally tear a good-sized airplane to pieces in midair. We replied to the FAA, pointing out that we regard such premeditated flying to be a violation of 60.12—which covers careless and reckless flying. We again recommended—for the latest of many times—that a speed limit of 180 miles per hour be established for the flight of all aircraft in joint-use airspace, below 2,000 feet. We have heard nothing further.

Mr. Chairman, I would like to submit for the record copies of the pertinent correspondence.

Senator MONRONEY. Is it very long? Do you mean for the purpose of the records of the committee or for the purpose of including it in the printed record?

Mr. HARTRANFT. It is your pleasure, Mr. Chairman. It is about six pages.

Senator MONRONEY. That will be acceptable. I wanted to be sure we didn't get into the hundreds of pages, which sometimes these records

contain. We could receive it for the committee records if voluminous.

(The correspondence follows:)

AIRCRAFT OWNERS & PILOTS ASSOCIATION,
Washington, D.C., October 12, 1959.

Mr. ELWOOD R. QUESADA,
Administrator, Federal Aviation Agency,
Washington, D.C.

DEAR MR. QUESADA: We were startled by an item in the October 9 Aviation Daily which described a recent flight of a Convair B–58 bomber from Carswell AFB to Vandenberg AFB and return. The item says the round trip was made in 04:04, for an average of more than 700 miles per hour.

Of particular significance to AOPA, however, is the fact that the outbound half of the flight was made "at an altitude of 500 feet or less."

As you know, the route from Fort Worth to Los Angeles is one of the country's most heavily flown by all types of civil and military aircraft.

Does it not strike you that such a flight, if the "500 feet or less" description is accurate, is an unwarranted breach of the civil air regulations, as well as the rules of simple common sense?

Sincerely,

MAX KARANT, *Vice President.*

FEDERAL AVIATION AGENCY,
Washington, D.C., October 23, 1959.

MR. MAX KARANT,
Vice President Aircraft Owners & Pilots Association,
Washington, D.C.

DEAR Mr. Karant: Your letter dated October 12, 1959, concerning the flight of a B–58 bomber at an altitude of 500 feet or less between Carswell Air Force Base to Vandenberg Air Force Base has been referred to this office.

We have no information concerning this flight and are referring this matter to our regional office, Fort Worth, Tex., for investigation and any appropriate folowup action, with a request that they forward a report concerning this incident.

We will advise you further on this matter after receiving the requested information from our regional office.

Sincerely yours,

WILLIAM R. KRIEGER, *Flight Safety Staff.*

CONVAIR NEWS RELEASE

FORT WORTH, TEX., November 10.—"Little Joe," a U.S. Air Force B–58 Hustler bomber, climaxed a routine test flight recently by streaking at an altitude of more than 50,000 feet from Seattle Wash., to Fort Worth—a distance of 1,680 statute miles—in exactly 80 minutes, it was announced today by Convair Division of General Dynamics Corp.

A few days before the 21-mile-a-minute high-speed dash to Fort Worth, the same "Little Joe" B–58 had made a 1,400-mile flight to California at 700 miles an hour—only 500 feet above the ground. No modification was made to the aircraft, a regular production-line B–58, for either the low- or high-altitude flight.

The high-speed flight from the Pacific Northwest to the B–58's home field at Carswell Air Force Base was made after a series of scheduled refueling hookups to demonstrate improvements to the Air Force's KC–135 tanker system.

The bomber maintained a speed of mach 2 (twice the speed of sound) for more than an hour on the homeward flight, then dropped down to a lower altitude over Dallas and landed at Carswell.

A standard B–58 pod, which can be used as a bomb or as a carrier of many types of special equipment, was carried beneath the delta-winged plane's fuselage throughout the flight.

AIRCRAFT OWNERS & PILOTS ASSOCIATION,
Washington, D.C., November 13, 1959.

Mr. WILLIAM R. KRIEGER,
Flight Safety Staff, Federal Aviation Agency,
Washington, D.C.

DEAR MR. KRIEGER: In view of the fact that your office apparently is unaware of the high-speed, low-altitude flight of the B–58, as indicated in your October 23 letter, I am enclosing a photocopy of a recent press release on the subject sent us by Convair. The second paragraph contains the pertinent reference.

Sincerely,

MAX KARANT, *Vice President.*

FEDERAL AVIATION AGENCY,
Washington, D.C., December 2, 1959.

Mr. MAX KARANT,
Vice President, Aircraft Owners & Pilots Association,
Washington, D.C.

DEAR MR. KARANT: This is in reply to your letter dated October 12, 1959, concerning an item in the October 9 issue of the Aviation Daily which described a recent flight of a B–58 Hustler aircraft from Carswell Air Force Base to Vandenberg Air Force Base at an altitude of 500 feet or less.

Upon receipt of your letter, we requested our Regional Administrator, Fort Worth, Tex., to investigate the matter and forward a report of his findings. He advised that on September 18, 1959, a low-level flight was conducted by Convair, a division of General Dynamics Corp., from Fort Worth, Tex., to Edwards Air Force Base, Calif., at altitudes generally between 300 and 500 feet. This flight was undertaken at the direction of the U.S. Air Force in the interest of our national defense to establish the characteristics of the B–58 airplane for low-altitude operations and to study the effects of such flights on the crew.

Your comment that such a flight is an "unwarranted breach of the Civil Air Regulations" apparently refers to the regulations relating to the minimum altitudes of flight. The low-level portion of the flight was conducted at subsonic speeds under visual flight rules along a very carefully selected course. It was specifically planned not to utilize established civil airways and to ensure that the operation would be over unpopulated or sparsely populated areas in order to avoid any possible violation of section 60.17 of the Civil Air Regulations. Convair stated that they believe these rules were not violated in the accomplishment of the flight, and we do not have any information to the contrary.

Your expressed feeling that this flight was a breach of the rules of simple commonsense may have been stimulated by the article in Aviation Daily which implied that it was conducted along one of the most heavily traveled airways and therefore created a collision hazard to members of your organization who may have been utilizing the airway at that time. However, as explained above, this flight did not utilize civil airways and was conducted under VFR conditions over sparsely populated areas. With the understanding that this flight was conducted under direction of the U.S. Air Force, we are of the opinion that all reasonable precautions were taken to reduce the possibility of collision hazard with any aircraft which may have been operated off-airways at that low an altitude.

Although the subject flight was an isolated "test flight," Convair has indicated that it will be necessary to conduct additional low-level flights in the future to further explore the operation of the B–58 airplanes in this environment. Accordingly, we are going to recommend to Convair that, prior to such an operation, a notice to airmen be published giving the approximate time, route, and altitudes of such a flight.

You will undoubtedly wish to notify the members of your organization who may be flying in the vicinity during the operation of future low-level flights of this nature that these flights are being conducted and appropriate notices to airmen will be issued.

Please let us know if you have any further questions relative to the subject flight. Also, we will most certainly consider any recommendations you may care to submit to improve the safety of similar low-level flights.

Sincerely,

JAMES T. PYLE
(Acting for E. R. Quesada, Administrator).

AIRCRAFT OWNERS & PILOTS ASSOCIATION,
Washington, D.C., December 10, 1959.

MR. JAMES T. PYLE,
Deputy Administrator, Federal Aviation Agency,
Washington, D.C.

DEAR MR. PYLE: Thank you for your December 2 letter explaining the recent flight of a Convair B–58 bomber from Forth Worth, Tex., to Edwards Air Force Base, Calif., at altitudes between 300 and 500 feet above the ground.

Frankly, we are astonished at what appears to be a callous disregard for safety on the part of the FAA in this case. While your letter is intended to give the impression that a maximum level of safety was insured prior to and during this flight, it appears that the only part of the Civil Air Regulations the FAA considered pertinent was section 60.17, which has to do with minimum altitudes that should be flown above the ground. The part of the Civil Air Regulations to which my October 12 letter had reference would be 60.12, having to do with careless and reckless flying.

As you have known for some time, proponents of "more safety" in the airspace—particularly those vociferous spokesmen for the military air services, the airlines, the Civil Aeronautics Board, and your own agency—have held forth long and loud on the hazards of "see and be seen" at just the normal operating speed of these so-called modern aircraft. These strong and repeated representations—"in the interest of safety," of course—were made when it suited the purpose of those making the statement. What they wanted to do was to drastically restrict the use of the airspace by aircraft neither equipped nor qualified to operate in the sophisticated manner customarily used by these professional groups. During the course of all these discussions there were repeated and elaborate references, complete with scientific "justification," to the effect that the human eyes simply can't see that fast any more.

Now, however, we find ourselves discussing what seems to me to be an incredibly hazardous flight just above the treetops, at speeds slightly below the speed of sound, and with the Federal Aviation Agency taking the position that it regards this operation as being safe. If "see and be seen" is hazardous for airplanes like the Douglas DC–6 and Boeing 707 at their normal cruising speed, how can it possibly be safe at 700 m.p.h. between 300 and 500 feet above the ground?

I realize, of course, that the much-used bromide—this is "in the interest of national defense"—has again been used in this case. In our opinion, this overworked excuse in no way lessens the hazard of this flight, or any comparable flight. Further, all of us in civil aviation look to the FAA to take a strong position in such matters, and not let itself be lulled into a false sense of security.

You close your December 2 letter by saying that the FAA will most certainly consider any recommendations we would care to submit to improve the safety of such low-level flights. We have these recommendations:

(1) Such flights must be barred from any joint-use public airspace at all times, no matter what the excuse. There is no such thing as a double standard in aviation safety, nor in any other safety. If it is unsafe for anybody to fly in this manner, then it is unsafe to permit the military to conduct such hazardous flights, whether they are "in the interest of national defense" or not.

(2) If such flights must be made so that the military can accomplish its mission, then those flights must be rigidly confined to closed restricted areas, or moved outside the United States entirely to such areas as Wake or Midway Islands.

For some time now AOPA has been recommending that the FAA adopt a mandatory speed limit of 180 miles per hour below 2,000 feet everywhere in the United States. This proposal has been largely ignored, a fact which makes your latest statement on this subject all the more disturbing.

It seems to me that if such extremely hazardous operations as the flight of this B–58, and the flight of other jet bombers in the "Oil burner" operation of the Air Force, now are regarded as being a safe operation by the FAA, all of us in civil aviation should be briefed by your organization on this new concept of aviation safety. Until now, AOPA has been openly critical of the actions of a number of civilian pilots—including some of our own members—when they have conducted their flights in a manner much less dangerous than these present military flights are being conducted. So it appears to me that perhaps the time has come for the FAA to reorient us on the basic fundamentals of aviation safety.

Sincerely,

MAX KARANT, *Vice President.*

AIRCRAFT OWNERS & PILOTS ASSOCIATION

WASHINGTON 14, D.C.

Press release—For immediate release

AOPA WARNS AGAINST HAZARDOUS JET FLIGHTS

High-speed low-altitude flights by military jet aircraft are not "in the interest of safety" and should be barred or rigidly restricted, the Aircraft Owners & Pilots Association (AOPA) has said in a strong letter to the Federal Aviation Agency.

Correspondence on the subject originated with the revelation of a recent flight from Fort Worth, Tex., to Edwards Air Force Base, Calif., of a supersonic Convair B–58 bomber. When AOPA learned that this flight was made at altitudes between 300 and 500 feet above the ground at an average speed of 700 mile per hour, a letter was addressed to E. R. Quesada, FAA Administrator, asking if he did not regard such a flight as "an unwarranted breach of the civil air regulations, as well as the rules of simple commonsense." In the absence of Mr. Quesada, James T. Pyle, Jr., FAA Deputy Administrator, replied in part:

"This flight was undertaken at the direction of the U.S. Air Force in the interest of our national defense to establish the characteristics of the B–58 airplane for low-altitude operations and to study the effects of such flights on the crew.

"Your comment that such a flight is an 'unwarranted breach of the civil air regulations' apparently refers to the regulations relating to the minimum altitudes of flight. The low-level portion of the flight was conducted at subsonic speeds under visual flight rules along a very carefully selected course. It was specifically planned not to utilize established civil airways and to insure that the operation would be over unpopulated or sparsely populated areas in order to avoid any possible violation of section 60.17 of the civil air regulations. Convair stated that they believe these rules were not violated in the accomplishment of the flight, and we do not have any information to the contrary. * * *

"This flight did not utilize civil airways and was conducted under VFR conditions over sparsely populated areas. With the understanding that this flight was conducted under direction of the U.S. Air Force, we are of the opinion that all reasonable precautions were taken to reduce the possibility of collision hazard with any aircraft which may have been operated off-airways at that low an altitude.

"Although the subject flight was an isolated 'test flight,' Convair has indicated that it will be necessary to conduct additional low-level flights in the future to further explore the operation of the B–58 airplanes in this environment. Accordingly, we are going to recommend to Convair that, prior to such an operation, a notice to airmen be published giving the approximate time, route, and altitudes of such a flight. * * *

"We will most certainly consider any recommendations you may care to submit to improve the safety of similar low-level flights."

An AOPA official has just sent this reply to Mr. Pyle:

"Frankly, we are astonished at what appears to be a callous disregard for safety on the part of the FAA in this case. While your letter is intended to give the impression that a maximum level of safety was insured prior to and during this flight, it appears that the only part of the civil air regulations the FAA considered pertinent was section 60.17, which has to do with minimum altitudes

that should be flown above the ground. The part of the civil air regulations to which my October 12 letter had reference would be 60.12, having to do with careless and reckless flying.

"As you have known for some time, proponents of 'more safety' in the airspace—particularly those vociferous spokesmen for the military air services, the airlines, the Civil Aeronautics Board, and your own agency—have held forth long and loud on the hazards of 'see and be seen' at just the normal operating speed of these so-called modern aircraft. These strong and repeated representations—'in the interest of safety,' of course—were made when it suited the purpose of those making the statement. What they wanted to do was to drastically restrict the use of the airspace by aircraft neither equipped nor qualified to operate in the sophisticated manner customarily used by these professional groups. During the course of all these discussions there were repeated and elaborate references, complete with scientific 'justification,' to the effect that the human eyes simply can't see that fast any more.

"Now, however, we find ourselves discussing what seems to me to be an incredibly hazardous flight just above the treetops, at speeds slightly below the speed of sound, and with the Federal Aviation Agency taking the position that it regards this operation as being safe. If 'see and be seen' is harzardous for airplanes like the Douglas DC–6 and Boeing 707 at their normal cruising speed, how can it possibly be safe at 700 miles per hour between 300 and 500 feet above the ground?

"I realize, of course, that the much-used bromide—this is 'in the interest of national defense'—has again been used in this case. In our opinion, this overworked excuse in no way lessens the hazard of this flight, or any comparable flight. * * *

"We have these recommendations:

"(1) Such flights must be barred from any joint-use public airspace at all times, no matter what the excuse. There is no such thing as a double standard in aviation safety, nor in any other safety. If it is unsafe for anybody to fly in this manner, then it is unsafe to permit the military to conduct such hazardous flights, whether they are 'in the interest of national defense' or not.

"(2) If such flights must be made so that the military can accomplish its mission, then those fights must be rigidly confined to closed restricted areas, or moved outside the United States entirely to such areas as Wake or Midway Islands.

"For some time now AOPA has been recommending that the FAA adopt a mandatory speed limit of 180 m.p.h. below 2,000 feet everywhere in the United States. This proposal has been largely ignored, a fact which makes your latest statement on this subject all the more disturbing.

"It seems to me that if such extremely hazardous operations as the flight of this B–58, and the flight of other jet bombers in the 'Oil-Burner' operation of the Air Force, now are regarded as being a safe operation by the FAA, all of us in civil aviation should be briefed by your organization on this new concept of aviation safety. Until now, AOPA has been openly critical of the actions of a number of civilian pilots—including some of our own members—when they have conducted their flights in a manner much less dangerous than these present military flights are being conducted. So it appears to me that perhaps the time has come for the FAA to reorient us on the basic fundamentals of aviation safety."

Mr. HARTRANFT. It is common knowledge in the aviation industry that shock waves generated by supersonic military aircraft create a grave hazard to civil aircraft operating legally in the navigable airspace. We recommend that a thorough study of the current problems be initiated by the Administrator of the Federal Aviation Agency and that subsequent civil air regulations, if necessary, be effected to provide adequate safety for all users of the airspace.

I don't know if the committee really understands what is involved in this. We had one of our representatives at a meeting the other day in which the question of supersonic booms was being discussed, and the proper altitude at which this could be done. Some of these military aircraft are flying today at or over 30,000 feet when they enter these sonic booms they are killing fish in the water.

This is no kidding matter. This is a serious problem, and we think that the matter we brought to the Administrator's attention is worthy of consideration and action.

Another case. Just the other day one of our members sent us a newspaper clipping from Cincinnati, describing in some detail how a military jet bomber (a B–66) was to be flown at high speeds, between 200 and 1,000 feet above ground, over three courses in Ohio—in some of the country's most heavily used airspace.

We immediately called this to the attention of the FAA in a telegram, asking that such flights be barred in the interest of safety, or require that they be confined to a large military restricted area nearby.

On January 4—4 weeks after sending the telegram—we received a routine letter from the FAA, saying that they didn't yet have any factual information on the apparent hazard, but that when they got something specific they'd let us know. We don't know what that jet bomber has been doing all these weeks.

We have heard nothing further from the FAA on this case either.

These two instances would not be particularly noteworthy, were it not for the fact that they are indicative and typical of what happens when specific matters involving safety come up.

I've used these two because they happened only recently; there have been many others, and they invariably follow the same pattern. We might bring to your attention, Senator Monroney, that although you stated during these hearings that we have had a year free of midair collisions, I assume you refer to Mr. Quesada's statement that there had been no air carrier collisions during the year, either. We would be happly to submit correspondence concerning that, if you wish.

Would you wish correspondence on that?

Senator MONRONEY. Yes, if it is not voluminous.

Mr. HARTRANFT. It is very short.

(The correspondence follows:)

JANUARY 5, 1960.

Mr. D. D. THOMAS,
Director, Bureau of Air Traffic Management,
Federal Aviation Agency,
Washington, D.C.

DEAR MR. THOMAS: Once again, and with considerable reluctance, I must express serious concern with the attitude of the FAA regarding a matter of aviation safety. I refer now to my telegram of December 17, referring to a newspaper report (dated December 14) saying that a B–66 jet bomber was to be flown at high speeds at altitudes of from 200 to 1,000 feet, over three routes in very heavily-used joint airspace in Ohio.

Because of what seemed to be a need for immediate action, AOPA described this apparent hazard in a telegram rather than a letter. Yet, 2 weeks later we receive a brief letter from you, saying that "the matter is being investigated and you will be advised further concerning it when we have some factual information."

It is disturbing to see that, 2 weeks after our initial report to you, that the FAA does not yet have some factual information on what appears to be an obvious hazard. In the length of time that has been permitted to elapse, a considerable number of such hazardous flights could have been conducted in that airspace.

May we suggest that first-hand information be obtained by telephone, and that prompt and positive action be taken to prevent any such flights that prove to be an unwarranted hazard?

Sincerely,

MAX KARANT, *Vice President.*

FEDERAL AVIATION AGENCY,
Washington, D.C., December 31, 1959.

Mr. MAX KARANT,
Vice President, Aircraft Owners & Pilots Association,
Washington, D.C.

DEAR MR. KARANT: This is to acknowledge receipt of your telegram of December 17, 1959, which refers to an article in the Cincinnati Post of December 14, 1959, concerning particular B–66 jet bomber operations in the vicinity of restricted area R–109.

The matter is being investigated and you will be advised further concerning it when we have some factual information.

Sincerely,

D. D. THOMAS,
Director, Bureau of Air Traffic Management.

AIRCRAFT OWNERS & PILOTS ASSOCIATION,
Bethesda, Md., December 17, 1959.

ADMINISTRATOR, FEDERAL AVIATION AGENCY,
Washington, D.C.:

The Cincinnati Post, of Monday December 14, 1959, states "Jet Bombers Fly at Low Altitudes." Article indicates B–66 jet bomber flown by Douglas Aircraft Corp. under contract with WADC, to fly along 3 routes at altitudes from 200 to 1,000 feet to study effects of wind gusts at low altitudes. One of three courses lie within restricted area R–109. Other two lie adjacent to but outside the restricted area.

Operation proposed appears hazardous and to violate Civil Air Regulations, section 60.12 (a), (b), and 60.17(c). In interest of safety recommend all flights be confined R–109 or barred.

MAX KARANT.

Mr. HARTRANFT. Unfortunately, the same is not true regarding other users of the airspace. Within the past 5 months three general aviation aircraft, all flown by AOPA members, have been run down and rammed by military jet fighters.

1. Cheyenne, Wyo., December 15, 1959: Gene A. Lewis, 37, St. Cloud, Minn., advertising executive, was rammed and killed by one of two Wyoming Air National Guard F–86's flying in formation. Lewis was flying a Beech Bonanza.

2. Beaufort, N.C., August 24, 1959: Jesse G. Taylor, 28, Beaufort, N.C., a fish spotter, flying a Piper Cub, was rammed and killed by one of a flight of Marine Corps A3D–1 twin jets near the Morehead, N.C., Yacht Basin.

3. Mansfield, Ohio, November 7, 1959: Arthur L. Stanley, flight instructor, and student, Arthur Allen, were both killed when their Piper PA22 was rammed by one of a flight of Ohio Air National Guard F84–F jets.

Four persons are dead and six aircraft destroyed because of military jets flying in formation in joint-use airspace. There were no military fatalities. We have again asked for the adoption of immediate safety precautions by the FAA, but--we have received no information regarding FAA's disposition of these recommendations.

We have for the record our letter containing four safety recommendations, addressed to the Administrator, Federal Aviation Agency, a two-page letter. Would you care for it?

Senator MONRONEY. Yes.

(The letter follows:)

AIRCRAFT OWNERS & PILOTS ASSOCIATION,
Washington D.C., December 21, 1959,

Mr. E. R. QUESADA,
Administrator, Federal Aviation Agency,
Washington, D.C.

DEAR MR. QUESADA: This letter is prompted by the latest fatal midair collision in which persons have been killed when a military jet aircraft has rammed a general aviation airplane. In the past 3 years we have had four such fatal accidents:

1. October 24, 1956 at Midland, Tex.: An Air Force T–33 overtook and rammed a Cessna 170, killing both occupants of the T–33 as well as five occupants in the Cessna.

2. August 24, 1959 at Cherry Point, N.C.: Here a Marine Corps jet rammed a Piper Super Cub, killing the pilot.

3. November 6, 1959, at Mansfield, Ohio: Two persons in a Piper Tri-Pacer were killed when an Air National Guard jet fighter rammed their airplane near the airport.

4. December 15, 1959: One man in a Bonanza was killed when one of two Air National Guard jet fighters rammed the Bonanza broadside near Cheyenne, Wyo.

While it is still to early to expect any positive action as the result of this latest fatal collision, we have had no indication whatever of any positive action being taken in the interest of safety by the FAA in these violations of the Civil Air Regulations. With this fourth collision, it appears that the matter has now reached a point of urgency demanding your personal attention, and forceful action.

A cursory study of all these accidents, and the facts connected with them, indicates simply that the military pilots are not looking where they are going. In no case was weather a factor, and visibility was unrestricted. However, in three of the four cases the military pilots were indulging in formation flying at high speeds and low altitudes.

AOPA feels strongly that positive action now must be taken immediately. We have four recommendations.

1. "Fighter break" approaches to any joint-use airport should be forbidden immediately. Military aircraft using joint-use airports should be required to fly the same traffic patterns as are required of all other types of aircraft.

2. Formation flying of high-speed jet aircraft in joint-use airspace should be barred below 15,000 feet. Three of the four accidents cited above involved high-speed jet operations in formation. It is well known that all pilots in such a formation keep their eyes glued to the leader, and hence do not look out for other aircraft. Of course, it is the leader's responsibility to do this, but he obviously was not doing so in these accidents. The very nature of such formation flying is conducive to a continuous and unwarranted hazard in joint-use airspace.

3. All jet aircraft should be required to fly at speeds no higher than 345 m.p.h. below 15,000 feet, and 180 m.p.h. below 2,000 feet. This recommendation was previously made to you January 12, 1959.

4. It is recommended that the FAA make a major effort to determine if it does not have greater authority to participate in the prosecution of violations of the regulations against military pilots. We have reason to believe that the Federal Aviation Act of 1958 gives the Administrator greater authority in this area than he has ever had in the past.

Now that we have had four fatal accidents involving some or all of these factors, it would appear that the FAA now has ample justification to act vigorously to assure that this kind of flying will be rigidly restricted in joint-use airspace.

Sincerely,

MAX KARANT, *Vice President.*

Mr. HARTRANFT. The Federal Aviation Agency currently has approximately 35,000 employees, or, stated in other terms, 1 employee for each 3 civil aircraft in the United States. Expressed another way, if a regulatory agency controlling automobiles were staffed in like ratio, they would have 22,800,000 employees. This is something

we might all ponder. It has been stated that the FAA will increase its staffing to 50,000 employees in the near future. It may be foreseen that the ambitious plans of some of the FAA divisions to expand their activities will further increase the overall size of the agency. Since the present trend of the expanded agency is to promulgate more and more regulations, it is inevitable that we soon will reach the point where our flying is buried under a confusing welter of regulations, at incredible cost to the taxpayer. The present day situation has reached a point where we have regulations so confusing and complex that even the FAA safety agents and the traffic controllers are hard pressed to keep abreast of their own current rules.

In the enforcement of safety rules, it has been publicly stated that the FAA policy is to be "fast, firm, factual, and fair." Unfortunately, the last two ingredients—namely "factual and fair"—appear to have been lost in the zeal to be fast and firm. Under the present administration of the Federal Aviation Act, a pilot may be charged with an alleged violation of the regulations and be given only the alternatives of paying a compromise fine—usually nominal—or taking his case to a Federal court. Presentation of the facts to the FAA—which may have filed the charges, which investigates the charge, which judges the case, which levies the penalty and which may have promulgated the rule—usually has no noticeable effect on the outcome of the case. While payment of a nominal compromise penalty of, say $50, is much cheaper than taking the case to a Federal court, where the average legal costs are about $500, the payment of the compromise penalty leaves an admission of guilt on the record of the pilot although he may be completely innocent. The viciousness of this procedure may be best illustrated by several examples of typical proceedings:

Two missionaries, both experienced instrument pilots, were on an instrument flight wherein it was necessary to obtain a clearance from the FAA. The clearance relayed to the pilot by the FAA communicator did not appear to be in order and the pilot asked for a repeat. This was done and the clearance copied by both missionaries. The pilot then repeated the clearance back and the communicator verified it. Subsequently, the pilot was charged with failure to comply with the clearance, even though he had carefully complied with all instructions received from the ground. It developed that the clearance given to the communicator for delivery did not match the clearance received by the pilot and verified by a repeat-back. There was no recording device on this radio circuit and the matter devolved into the word of the communicator against the word of the two missionaries in the airplane. The FAA gave the pilot the alternative of paying a compromise penalty of $50 or they would file charges against him in a Federal court. We have been told that the cost of defending a representative case in Federal court is approximately $500. AOPA protested this case to the FAA regional authorities and asked for a review, but the FAA attorney was adamant and insisted that the pilot was guilty of a violation by not following the correct clearance even though it may not have been transmitted to him correctly by the FAA communicator. The FAA attorney chalked up another victory when they accepted $50 out of the funds of the mission in settlement of this case.

Mr. Chairman, I have not included the names of these gentlemen of the cloth to avoid further and I think unnecessary embarrassment. We have the case here.

Senator MONRONEY. Will you give us the dates and the place. That would not necessarily involve the names of the missionaries.

Mr. HARTRANFT. April 27, 1959, Quincy, Ill.

They were fast and firm, but certainly not factual or fair. We cannot too strongly condemn this method of operation in Government, where a citizen is accused and stands guilty until he proves otherwise. All the more onerous is the fact that the accuser is also the prosecutor and the judge, and that any relief from this situation can be sought only at great cost through a Federal court.

The lack of a system of checks and balances and adequate appeal machinery that will afford an impartial hearing for a pilot is the greatest single areas of the Federal Aviation Act that needs clarification. When the act of 1958 was put in final form and passed by the Congress, a provision was included in section 609 for appeal to the Civil Aeronautics Board with regard to airmen and aircraft certificates. We soon discovered that this did not give the Board the authority to review or take any corrective action on a rule or regulation, but merely allowed the Board to hear an appeal with respect to whether or not the action against the individual was correct and proper under the terms of the rule. Thus, the Board could not consider or take any action with regard to correction of a faulty or unsound rule. We also discovered that it was relatively simple for the FAA to amend any rule under which they were receiving adverse rulings from the Board on actions against individual certificates. For example, that part of our testimony dealing with pilot qualifications and certification will cite the case of 11 pilots who were refused certificates by the Administrator because of medical reasons. These cases were appealed to the Board and these airmen were found by the Board to be physically qualified to fly.

The Administrator appealed the decision of the Board and tied up the issuance of the pilot certificates for a matter of months. In the interim, the FAA, through the Office of the Civil Air Surgeon, proceeded to change the medical rules so as to nullify the action of the Board. This action of the FAA, known as draft release 59–1, was highly controversial and was passed by the Administrator without a public hearing, although such a hearing had been requested. The Board, under the present wording of the act, has no authority to review or amend these rules. Unless such authority is granted to the Civil Aeronautics Board by the Congress, the whole idea of appeals becomes a mockery, as demonstrated by the case of the 11 expilots, 7 of whom were AOPA members. The names and the docket numbers of these arbitrarily grounded pilots are as follows: George F. Baker, Jr., docket SR 2538; Ernestine Brennan, docket SR 2345; Owen L. Butler, docket SM 2–8; James E. Easton, docket SM 2–9; A. C. Holder, docket SM 45; William A. Horton, Jr., docket SM 3–2; Silas R. Langlois, docket SM 1–1; Ralph B. Muse, docket SR 2526; Ralph C. Parker, SR 2347; H. S. Seabrook, docket SM 2–5; and Robert E. Trump, docket SM 2–2.

I understand, Mr. Chairman, that Mr. A. C. Holder has asked to be heard by this committee when that portion of the regulations is

considered. We believe it would be worthwhile for the committee to hear such testimony.

Senator MONRONEY. We expect to hear adequate testimony on this subject, and we will certainly see to it that some representative at least of these men—I don't know whether we will have the time to hear all 11 of them or not—will outline the case. To further identify this, this is in connection with draft release 59–1, which deals with the question of refusing to license a pilot who has a history of cardiac, diabetic, or psychiatric conditions, does it not?

Mr. HARTRANFT. That is correct. It is being brought up at this time only with respect to the wording of the Federal Aviation Act which permits an executive agency to nullify or circumvent decisions and rulings of an agency of the Congress.

Again, a system of checks and balances is the very foundation of our American way of life, and is strangely lacking in the aviation field. To correct this and to clarify the act, we recommend that section 601 of the Federal Aviation Act be amended by the addition of the following subsection:

601.(d) The Civil Aeronautics Board, by its own act or upon the application of any affected person, may review any rule, regulation, standard, or order issued or made by the Administrator under this title (VI). The Board, insofar as practicable, shall give such review priority over other proceedings under this act. Upon such review the Board shall have authority in the public interest to revoke or modify any such rule, regulation, standard, or order. Pending such review and determination thereon, the Board, by its own act, or upon the application of any interested person for good cause shown, may suspend the effect or operation of any such rule, regulation, standard, or order. Nothing in this subsection shall be construed as amending, modifying, or repealing any portion of the Administrative Procedure Act.

The Federal Aviation Agency has been sharply criticized by all segments of the aviation industry for its failure to hold public hearings on proposed new rules. The FAA now has explained that written comments should be sufficient to bring out all pertinent comments on proposed rules, and that verbal argument probably would do nothing more than becloud the issue.

This is based on the FAA concept wherein they would hear all interested parties, but would present no argument or justification for their proposed rulemaking and would answer no questions from other parties participating in the hearing. The obvious flaw in this practice is that the FAA is not required to justify or to reveal its full reasons therefor to the public. The opponents of the proposal are given the full burden of showing why it should not be placed in effect. They do not even have the advantage of full knowledge of the proponents' reasoning.

Until recently, organizations and individuals in the aviation field who requested hearings from the FAA, did so on the assumption that they would get a full evidentiary hearing wherein both sides of the question would be thoroughly explored, as in the past. No single agency, individual, or organization is so knowledgeable or infallible that it can render its decisions without benefit of discussion of all pertinent factors. Our courts and the very foundation of our American way of life, the Congress of the United States, operate in this manner. Yet, the FAA feels that they can dispense with such hearings in the interest of speed and efficiency. We feel that we can

dispense with some of the speed and so-called efficiency in favor of making sure that the ultimate decision is right, and that the rights of individuals are preserved as guaranteed under the Constitution and the Bill of Rights.

Another area in which our pilots have serious, almost daily problems with the FAA's present method of doing business is in the area of civil penalties. The FAA procedure in a typical case goes like this:

Someone in the FAA decides that pilot X may have committed one or more violations of the civil air regulations. Pilot X soon receives a form letter from the FAA, saying that the FAA has information that the pilot may have violated certain sections of the regulations—which they refer to by number. Later in the same letter, pilot X is asked for his comments. If pilot X is typical of the great majority of pilots we deal with, he promptly writes a long, elaborate, detailed letter designed—he thinks, innocently—to disprove those allegations, and to set his record straight.

The next thing he knows, he gets another form letter—this one by registered mail—and it is here, for the first time, that well-meaning pilot X realizes he has naively thrown himself to the wolves. Because this letter not only cites him for the original allegations, but adds any number of new ones, depending upon how many the FAA attorneys can devise from the reply pilot X sent in to the first letter.

This second letter then winds up by saying, in effect, that the FAA hereby finds pilot X guilty on all charges, that the maximum fine possible on each charge is $1,000, but that the FAA accuser—switching his hat to that of judge for this particular paragraph—has decided that the level of pilot X's guilt is not such to warrant the maximum penalties. Therefore, the letter says, the FAA has determined that it will settle for, say, $25. By this time, pilot X is perspiring freely, glancing back repeatedly to the alternative of a court trial and the total possible penalty he could be forced to pay. Usually, in something of a panic, he fires off the $25 as fast as the mails will get it to the FAA. In so doing, he has admitted guilt—though he frequently is completely innocent—and the blot remains on his record forever.

Here is the text of two pertinent paragraphs from this letter:

> Section 901 of the Federal Aviation Act provides that any person who violates section 610(a) of the act may be subject to a civil penalty not to exceed $1,000 for each violation. However, in order to provide for settlement of civil penalties on a just basis, the act authorizes such penalties to be compromised at amounts less than $1,000. Our attached letter states the sum which we are willing to accept in full settlement of the alleged violation(s).
>
> There is no requirement under the Federal Aviation Act that you make an offer of settlement as suggested in our letter. If you prefer, you have the right to have any issues in this matter presented to the United States district court. On the basis of the evidence presented at a trial, the United States district court will determine whether a violation has, in fact, occurred and the amount of the civil penalty, if any, which will be imposed. If you desire to have the matter determined in this way, you need only to indicate your preference.

Unfortunately, in the majority of cases, pilots, in their desire to cooperate with FAA, write their letter of response without consulta-

tion with us or with their attorney, and inadvertently implicate themselves in the technical and legal procedures of FAA.

I would like to pause for a moment and say that it is not our policy, Mr. Chairman, to take the position, ever, that every one of our members is always right. I think the FAA people involved will agree with us that it is a rare instance where we ever intervene in a case involving a pilot violation. In the great majority of cases we review the letters we get, and we indicate to the pilot he has made his bed and he had better go lie in it.

However, in these cases, when they come along, we find it is imperative that all civil pilots so accused, who are, after all, American citizens, have access to due process of law, before a fair and impartial hearing. The sixth amendment of the Constitution describes the safeguards we seek. The present FAA may be a good deal more vigorous, forceful, and streamlined than its predecessors, but it also is encroaching upon the right of individuals to get justice under our democratic processes. George Washington said it:

> The spirit of encroachment tends to consolidate the powers of all departments in one, and thus to create, whatever the form of government, a real despotism.

AOPA feels we can eliminate the most onerous part of this problem by amending the first sentence of section 901(a)(2) to read as follows:

> 901(a)(2). Any such civil penalty may be compromised by the Adminstrator in the case of violations of titles III, V, or XII, or any rule, regulation, or order issued thereunder and by the Board in the case of violations of titles VI, VII, or any rule, regulation, or order issued thereunder or the Postmaster General in the case of regulations issued by him.

A matter which has caused considerable dissatisfaction on the part of industry with the administration of the Federal Aviation Agency under the act of 1958, is the lack of advance consultation and coordination with industry, prior to legal promulgation of proposed rulemaking. As you gentlemen know, the unsatisfactory operation of the old Civil Aeronautics Administration within the framework of the Air Coordinating Committee, led to the inclusion of language in section 301 of the act of 1958 to prohibit the Administrator from submitting his decisions for the approval of any committee, board, or other organization created by Executive order. We were among the critics of the old CAA–ACC relationship and we wholly support the inclusion of this provision in the Federal Aviation Agency Act. It is unfortunate that the zeal of the FAA staff to comply with this mandate from the Congress has apparently led to an interpretation that has effectively prevented adequate advance consultation with industry prior to institution of formal rulemaking procedures.

This has created a great area of dissatisfaction on the part of general aviation and has caused an untold amount of bitterness, wrangling, and unnecessary work on the part of all concerned. AOPA, and others in industry, repeatedly have requested the FAA to seek the advice of knowledgeable persons and organizations outside of Government in order that the decisions of the Administrator, when made, may be based upon the best knowledge available throughout the aviation community. We do not believe that it was the intent of the Congress to restrict the FAA in obtaining the best possible information prior to decisionmaking, but it appears that clarification

of the act is necessary so that there will be no further misunderstanding in this respect.

Accordingly, we recommend that section 301(a) of the act be amended by adding the following sentence:

> Nothing in this section or act shall preclude the Administrator from consulting with and obtaining the views of all interested parties so that he may be fully informed before making decisions.

Senator MONRONEY. Is it your contention that the act does preclude him now from consulting and obtaining these views?

Mr. HARTRANFT. We believe, as indicated in my testimony, Mr. Chairman, that the FAA staff apparently in its zeal to comply with the mandate from Congress, which involved elimination of the old Air Coordinating Committee, with which we agreed, have led to an interpretation that has effectively prevented advanced consultation with industry prior to the institution of formal rulemaking procedures.

Senator MONRONEY. I don't understand that. If there is nothing in the act that would indicate that they are not—and I don't think there is any evidence that has been presented here that they are not—how this proposed amendment, as innoxious as it may be, would require enactment.

If you wish to get it affirmatively, if you feel the need is great, then it would have to be on a positive instead of a negative basis.

Mr. HARTRANFT. We would not object to a positive statement at all, Mr. Chairman.

Senator MONRONEY. This section that you are talking about relates to committees created by Executive order.

Mr. HARTRANFT. Yes. As you will remember, sir, under the old system the CAA, it was found, had delegated a great deal of the statutory authority to various ad hoc groups, the Air Coordinating Committee and so on.

Senator MONRONEY. And to the Administrator of the Civil Aeronautics Agency for various forms of rulemaking.

Mr. HARTRANFT. I am talking about the delegation now of the CAA prior to the enactment of the act under which we now operate. This was what led to the inclusion of the language in section 301: To prohibit the Administrator from substituting his decisions for the approval of any committee, board, or other organization created by Executive order.

As I have said, apparently in their zeal to comply with this mandate, they have gone to the complete other extreme and have effectively presented adequate advance consultation with industry prior to institution of the formal rulemaking procedures.

There are memorandums of instruction apparently within the FAA now which ask for completed staff work before any proposed rulemaking appears in the Federal Register.

In other words, the decisions made with respect to the detailed requirements of a rule before industry is exposed, and we find ourselves constantly then in the position of having to defend a decision that is already made.

Senator MONRONEY. We discussed this same subject this morning, concerning the decision to allow testimony after the fact instead of before the fact.

Mr. HARTRANFT. I think in a word the FAA has interpreted this section 301 to include other coordination rather than just Executive order, which that had been aimed at in the initial legislation.

Senator MONRONEY. Do you have any correspondence that would so indicate, or citing any rules or regulations of the FAA?

Mr. HARTRANFT. Yes, sir, we do.

Senator MONRONEY. Would you insert those or read those at this point?

Mr. HARTRANFT. May we bring those to you for inclusion in the record? I don't have that with me. We do have them.

Senator MONRONEY. We are interested of course in this preconference rather than postconference point. We do not see at the moment why we should amend a section dealing completely with a different matter so as to say that it does not preclude consultation.

The history of the act, the history of the debate on the floor, the report and everything else, did not to my knowledge indicate any such preclusion of industry conversations, discussions, or even open public hearings.

Mr. HARTRANFT. That is quite right. Then it comes down to the matter as to the policy of the Administrator and his desire to do so.

Senator MONRONEY. That is what led to the desire of this committee, to have at the end of the first year of operation of the FAA, this prolonged and I hope thorough discussion regarding the operation of the act.

Mr. HARTRANFT. I think we are both saying the same thing, Senator. I merely indicated that since there had been a demonstrated reluctance on the part of the FAA to do this, and a statement on the part of some of their personnel that they felt they had a mandate not to do so, that there was confusion with respect to whether this was to apply to committees of an executive agency or whether this was to apply to all committees, meaning committees composed of industry; and that to clarify in the minds of the FAA Administrator and his staff the fact that they could do so, we offered for your consideration this particular passage.

We would certainly have no objection if this were turned into an affirmative directive. As a matter of fact, in our legislative recommendations last year I believe we had such a recommendation.

Senator MONRONEY. You would not want to include the Executive-appointed committees, would you?

Mr. HARTRANFT. That is correct.

Senator MONRONEY. Then we would get back into the morass that we formerly were in.

Mr. HARTRANFT. No, sir. We are all in agreement on that.

Previous discussion between Senator Engle and Mr. Quesada on January 13 concerned the near-miss reporting program as it relates to FAA activity in the enforcement field needs some clarification. As I read the testimony, there was an inference there I think in the exchange—and I am afraid Mr. Quesada didn't mean to imply it but I am afraid it is there—that we have somehow been uncooperative on this particular thing. I would like to set this down so that we would all understand what it was that happened there and what was wrong with the situation.

In 1956, to encourage pilots to report a near-miss with other aircraft in flight, the CAB instituted a program whereby reporting pilots would be promised immunity from violation charges. The immunity provision was contained in special Civil Air Regulation SR–416, "Voluntary Pilot Report of Near Midair Collision." Here is the history of SR–416:

February 23, 1956. The special regulation became effective. Immunity was promised to reporting pilots provided information of a violation was not obtained from other sources.

July 23, 1958. The CAB announced revision of SR–416 to place emphasis on particular circumstances in the report rather than statistical aspects.

January 1, 1959. The FAA was organized and took over safety regulation functions of the CAB. Near-miss reports given by pilots to FAA field personnel, which previously had been sent to the CAB, where immunity rested, were now filed with the FAA, but the pilots did not know this.

March 9, 1959. The FAA in a press release stated that near-miss reports should be phoned in immediately to a new "clearinghouse" facility at Washington Air Route Traffic Control Center known as Central Reporting Office. The press release did not mention that SR–416 was not binding on FAA and that near-miss reports would be filed at the pilots' own peril. The immunity provision was still in effect but pertained only to reports that might reach the CAB.

July 15, 1959. FAA and CAB issued simultaneous announcement that SR–416 was revoked, effective immediately.

Senator MONRONEY. Did that have the effect of revoking the immunity of reporting pilots by both agencies?

Mr. HARTRANFT. Yes.

In the 6-month period between January 1 and July 15, 1959, the FAA was accepting near-miss reports from pilots, who had not been informed of the change in handling or the lack of immunity. This first came to our attention through the protests of our members, who were being charged with alleged violations based on their voluntary reports. It is our understanding that either one or both parties involved in all such reports were charged by the FAA. A number of organizations, including ours and the U.S. Air Force, warned their pilots of this procedure. Copies of the Air Force notice are, I am informed, in the hands of a number of responsible FAA and CAB employees, who are in the active reserve.

The operating technique of the FAA in this matter could hardly be termed as fair or designed to inspire confidence and cooperation with the FAA.

The regulations recently passed by the FAA, requiring certain basic instrument orientation for new pilots, was endorsed by AOPA. I state this because there was some inference that we had not been cooperative in safety matters. I would like to dwell on that. The AOPA Foundation pioneered this concept long before this rule was made.

By way of explanation, the purpose of the AOPA Foundation, Inc., as stated in its certificate of incorporation, is:

> To promote safety in every manner in all phases of aviation, and to engage in research and investigation upon, and the dissemination of, the science and scientific aspects of aviation and kindred subjects.

This safety organization is supported solely by contributions, including a voluntary donation tendered with their annual dues by each AOPA member. It is remarkable, I think, that only three members to my knowledge have ever declined to make this annual donation. Could there be better evidence of our members' interest in safety?

A grant was given by the AOPA Foundation to the Institute of Aviation of the University of Illinois for the development of a lifesaving technique which would permit a pilot to maintain control of his airplane when inadvertently confronted with instrument conditions and make a 180° turn to get out of the bad weather. This is strictly a lifesaving technique.

I would like to pass on to members of this committee copies of the AOPA curiculum. Because of its size, I will not ask that it be put in the record. I would pass it on for your information.

Senator MONRONEY. Thank you. It is very helpful.

Mr. HARTRANFT. We have certificated 350 instructors and payment for a large part of this training program was made out of AOPA Foundation funds. A list of these instructors will be found on pages 76, 77, and 78 of the January 1960 issue of the AOPA Pilot already placed in the record by Mr. Quesada. I speak of it here, not for establishing credit for us but to correct any misinterpretation you gentlemen might have gained from Mr. Quesada that my organization is not interested in safety or does not actively participate in safety work, including the expenditure of our own funds for this purpose. I do not think the charge of being "obstructionists," of being "selfishly motivated," or of "parochial interests" can be made to our organization with any justification.

Senator MONRONEY. This booklet is in relationship and in general agreement with, I take it from the beginning of this line of testimony, with the rulemaking that has now been published, but I don't believe yet in effect, for basic instrument training for all pilots acquiring new licenses, or for the presently licensed pilots as well?

Mr. HARTRANFT. Mr. Chairman, this is for new pilots. It has been passed. It has an effective date of March 15. Our organization did actively support it. Actually, with one or two very slight technical differences, what the regulation calls for is exactly what we pioneered in the 180° rating.

Senator MONRONEY. This would then be in addition to the recommendations that you say earlier in your statement you have made to the FAA for air safety rules; is that correct?

I mean, you gave a list of a certain number of things to which you indicated no attention had been paid. This at least is in conformity to the rulemaking that they have engaged in?

Mr. HARTRANFT. Yes, sir.

For the record, Mr. Chairman, on January 12, Senator Engle, in questioning the veracity of the FAA position that the old system of CAA appointed physicians was abolished because of a shortage of

doctors, quoted part of a text of a letter which I should like to fully identify.

The question was raised, I believe by Mr. Quesada, as to the date. The date of this letter was July 31, 1959, a letter written by former CAA Administrator T. P. Wright, at the time the medical examination situation was discarded. He addressed that letter to Mr. Jerome Lederer of the Flight Safety Foundation. Mr. John Geisse, whose name was entered in the record, one of our 8,000 members, wrote to the AOPA Pilot after receiving the concept of Administrator Wright to forward the letter.

Senator MONRONEY. Do you know during what years Mr. Wright was Administrator of the CAA?

Mr. HARTRANFT. I think 1947. It was in the immediate postwar period.

This concludes my testimony on the general aspects of the administration of the Federal Aviation Act and those matters relating to general safety. We will present additional detailed testimony on the specific subjects of "Air Traffic Control," "Airspace Management," "Pilot Qualifications and Certification," and "Military Participation Within the Agency" as these subjects are scheduled for hearing by your committee.

I will be here and available always but I will rely on my technicians to carry the ball on some of these subjects. I would like to express my thanks and appreciation on behalf of our 80,000 pilot members for the invitation and the opportunity of appearing before your committee on these matters of vital importance to the flying public.

Qualifications of J. B. Hartranft, Jr.; president, Aircraft Owners & Pilots Association, membership, 80,000 pilots and owners; president, AOPA Safety Foundation, Inc.; publisher, the AOPA Pilot magazine; licensed commercial and instrument pilot; aircraft owner (operating from National Airport, Washington, D.C.); former secretary, Interdepartmental Air Traffic Control Board; former lieutenant colonel, Army Air Force; member, executive committee, radio technical committee for aeronautics; member, steering committee, General Aviation Council; member, joint civil-air defense committee; et cetera.

Senator MONRONEY. We appreciate very much the completeness of your testimony, and also for the suggestions that you made as to how the act may be improved by either legislative changes or by changes in the act itself. As you well say, no act is so well written that after experience it can not be improved upon.

Certainly this is one of the purposes of examination after the passage of 12 months under the act to find out which bearings are loose and knocking and which need to be tightened up.

I would like to get you to detail the difference in these civil penalties from that which existed under the old act. I think it would be helpful to the committee in considering these changes.

Mr. HARTRANFT. Mr. Chairman, I would like to pass the ball on to Mr. Armour, who has the advantage of having written most of those original regulations when he was with the Board, I think.

Mr. ARMOUR. Mr. Chairman and members of the committee, the civil penalty procedure at the present time is the same as it was under the 1938 act. It has been long improper, inadequate, and wholly

unfair. To illustrate it a little, we have now in the act and have had in the act since the 1938 act was passed—not since the beginning, but after the reorganization plan—a triple headed jinx.

A pilot can be subjected to a civil penalty, and in order to defend against that he must go to the Federal court. He can at the same time be prosecuted with respect to his certificate, and it may be suspended or revoked.

At the same time a State may take action against him for violation of a State regulation so he can be prosecuted and found guilty and penalized three times. This I consider needs and demands a remedy.

Senator MONRONEY. The point I am making is that the new act has been under attack as though it had changed the then existing law in this respect. I found nothing in the statement which indicated that whatever evils may have existed had perhaps been carried forward, as you say, into the new act.

It is not the creation of the present act that is a detailing of a new imposition, but the continuing of the old.

Mr. ARMOUR. Except that under the new act we now have an administrator who makes the rules and who makes the determination in the original instance both of the suspension, revocation, and the civil penalty. So we haven't changed the civil penalty, Senator, but we have changed the other provisions of the act which make the whole thing worse than it was.

Senator MONRONEY. At the time the act was passed a great portion of the rules were made by the then CAA Administrator under delegation of the Civil Aeronautics Board which was too busy to make them or unacquainted with the situation. Is that not a fact?

Mr. ARMOUR. I wouldn't say——

Senator MONRONEY. If I remember the testimony, a great part of the rulemaking function had been surrendered or delegated by the CAB to the Civil Aeronautics Administrator.

Mr. ARMOUR. I wouldn't say the substantial portion. I would rather not get into that. That is not strictly a legal problem, although from my long experience with it, I would say in my personal experience the bulk of the rulemaking was not delegated to the CAA. And insofar as it was, it was delegated with the right of review, and that was what provided for civil aviation and general aviation a very thorough protection.

Senator ENGLE. Will the chairman yield?

Senator MONRONEY. Yes.

Senator ENGLE. What we have now, we have the FAA Administrator making the rule, then he turns around and acts as judge, jury, and prosecutor. Then you have an appeal to him, not only with reference to whether the rule is sound but whether you are guilty under the rule. If there is any assumption from that kind of a situation that you are going to get any kind of fair consideration on appeal, it is not something that developed in my experience in the law.

As I said earlier today, I have grave misgivings about being given the right to appeal to the man who ruled against me in the first place.

Senator MONRONEY. You still, though, have the right to appeal in the court, the Federal court in your own jurisdiction. We didn't set up any special courts. We figured that we would give a chance to compromise, or dispose of minor infractions without putting the pilot

to the long expense and delay which was occasioned under the old review by the CAB.

I have had a great many complaints from pilots who waited with an unresolved charge against them for 2 years, waiting for the Civil Aeronautics Board to get around to hearing their case, which was generally a matter of submission of documentary evidence and not of oral testimony, and their complaints were numerous and strong against the system that required the expensive operation of the appeal to the CAB.

Senator ENGLE. I think something ought to be done with it.

Senator MONRONEY. And then another expensive trial, counsel advises me, to the district court, which is more expense than the average pilot could be put to.

Senator ENGLE. Mr. Chairman, we may need an air traffic court of sorts. It just seems wrong to me to have one outfit making the rule, enforcing the rule, and then arrogating to itself the appeal, and sending appeal on a letter saying, "You either pay this $25"—or $50—"or you may be soaked $1,000 on each count and hauled into a Federal court in a highly formal proceeding."

I assume the Federal court would mean before a Federal commissioner or before a Federal district court.

As I say, we may need a sort of an air justice court to handle these violations expeditiously. But on the fact of it, it just isn't a fair procedure.

Further than that, it violates every basic concept of Anglo-Saxon law and justice.

Mr. ARMOUR. It couldn't be said better.

Senator MONRONEY. I am aware of the strong line of testimony that the Federal Aviation Act permits that, but I can see no difference as it is applied now with the Federal Aviation Administrator making these rules and the procedure that was in process from 1938 when the original Act came in where the Civil Aeronautics Board made the rules and then made the determination of the violations and the penalties levied on the pilot.

Senator ENGLE. Are you saying that because it existed before it is good now?

Senator MONRONEY. No, I am not saying that. You are putting words in my mouth.

Senator ENGLE. I don't want to do that.

Senator MONRONEY. There is nothing in this statement that would indicate that any of the errors of which he complains, and which he well documents—these fundamental guarantees of liberty—that were not inherent in the same process that we had existing from 1938 until 1959.

We tried to make it simpler so that the pilot would not have to wait a long period of time and would not have to subject himself to heavy attorney fees to be represented in Washington, D.C., before the Civil Aeronautics Board.

If the act needs to be corrected, it can be corrected, but I think the facts should be laid out here that this is a matter that existed for a considerable period of time—this same philosophy where the rule-maker and the judge of the charged violation was one and the same

person, with an appeal to the Federal court, which is the same appeal as is guaranteed today.

Senator ENGLE. Let me get the bill of particulars on the record so we will have all the facts. It is worse (1) because the FAA makes the rules, then makes itself the judge, jury, and prosecutor with reference to the enforcement of those rules. And, No. 2, it is worse because there are more rules.

Mr. HARTRANFT. Mr. Chairman, I think we can document this and perhaps save the committee time. We have a number of cases. We have one chap on a revocation. I think he has already spent over $2,500 trying to get justice. Knowing now of the committee's interest in this, may I ask that we be allowed to submit a supplemental statement by which we might cover this case with some degree of thoroughness, by giving some case histories to illustrate the nature of our complaint.

Senator MONRONEY. We would like to ask you what is the most frequent violation for which the civil penalties have been levied?

Mr. HARTRANFT. Part 60 of the Civil Air Regulations, I believe would be the most general, Senator.

Senator MONRONEY. What is that?

Mr. HARTRANFT. Some part of part 60. That covers all of the Civil Air Regulations, what we might call the rules of the air, air traffic rules.

Senator MONRONEY. Air traffic rules, such as flying at the proper altitudes, going in various directions, and the matter of procedures on landing, order of precedence and things of that kind.

Mr. HARTRANFT. Yes, sir.

Senator MONRONEY. Crossing runways, perhaps, which many pilots sometimes forget to check with the control tower for clearance in crossing a runway, in the taxi areas. Is that correct?

Mr. HARTRANFT. That is correct.

Senator MONRONEY. This is the most frequent cause?

Mr. HARTRANFT. Yes.

Senator ENGLE. Would you yield for a further inquiry?

Senator MONRONEY. Yes.

Senator ENGLE. Taking this case where they hauled off and cited these fellows who reported near-misses, the reason that could happen is easy. A fellow may be descending, and he is descending, coming into an area and he gets a near-miss. He reports it. He reports the near-miss at 6,000 feet, and he ought not to be at 6,000 feet according to their regulations. It is even plus five going west, and odd plus five going east.

So on the face of his paper, and without any further explanation, they sock a penalty on him and then tell him that he is going to have to pay $25 or $50 or go to court. If he had been real shrewd about it he would have said, "I was descending when I had this near collision," but he didn't put it in.

You just don't dare touch it. You have to handle it with a set of asbestos gloves if you are doing anything with the FAA because they are liable to turn around and haul you into court or jeopardize your license. That is why these private pilots are getting so skittish.

Senator MONRONEY. How many cases are pending to your knowledge; from your memory, involving prosecution for near-misses on self-reported accidents?

Mr. HARTRANFT. There are two or three things covered here.

May I make one comment before I lose it?

Senator MONRONEY. Certainly.

Mr. HARTRANFT. In response to Senator Engle I am inclined very much to agree with you, Senator. This whole matter of enforcement depends an awful lot on the attitude of the enforcing officer on what kind of cooperation he is going to get. In such a case where a man may report in, coming into an airport, for instance, he may be asked his altitude, he will say, "6,000" or "6,000 descending" indicating he is starting his descent.

We have had situations where the man said "6,000" and didn't put the word "descending" on and he may be charged with a violation. This is tricky.

I find in all my years of dealing with pilots that most people are sincerely trying to follow the rules. They know that the rules are for their own safety. To put a penalty on these technical trickeries just for the purpose of running up some sort of a box score like the traffic cop who has a certain quota to meet of fines, is not the way to get good enforcement and respect for enforcement. You have to have respect for enforcement.

Senator ENGLE. That is precisely the point I was making with General Quesada when he was on the witness stand the other day.

Mr. HARTRANFT. The reason I brought up this question about this near accident business was, as I understood Mr. Quesada, he had some rather disparaging comments to make because we had complained that our members were being tricked. I have explained exactly how it was that they were. And I have indicated to you that not only we found it necessary to give this kind of advice to our members, but even the military establishments did the very same thing. So if we are to be tarred for that, then the whole chain of command, right on down through the Military Establishment, ought to be included. I don't think we should be tarred for it. I thought it was a very unfair statement.

Senator MONRONEY. What I was trying to ascertain from my questions, is in this period in which it was not apparent to pilots that they were putting themselves in jeopardy by reporting these near misses, which existed apparently from the time the FAA took over through some kind of bureaucratic mixup between the FAA and CAB, how many of these men were in jeopardy and how many cases were pending?

Perhaps we can get that from the FAA.

Mr. HARTRANFT. It would be part of the 3,000 that the FAA has already indicated. What the quantitative portion is we would have to get from the members, Mr. Chairman.

Senator MONRONEY. At this point I think it is interesting to note the consolidated report for 1959. There were violation reports of 3,884. There were civil penalties taken against 1,093; certificate action taken against 948. Reprimands, 861; referred to military, 65; filed "no action," 280. Apparently for a total action of 3,247 actions

taken, leaving the residual number, I presume, that had not yet been cleared.

This is out of a great deal of air hours, is it not? I think you mentioned the magnitude of flying, and I presume this is consolidated not only to the private pilots but this is everything, including airlines and military and everything else.

Mr. HARTRANFT. Of course I think I would be doing a great disservice to my constituents if I took the position that even if that unfair practice happened to just one, that was wrong. There were a great many. But I don't think the quantitative number is the point at issue here. This is the method by which a lot of these things are being done.

I do not want to get into our future session, but it is a numbers concept that over age 60, if there might be 3 who possibly could, out of 10, then the answer is you do not let all 10. There is a matter of individual rights that comes in here and this is what we have lost.

This is a system of checks and balances which we have dumped out on all of these issues, and it is the one and the sole thing that has us in trouble.

Basically the act is very good as written. We went too far. If we could just get back in now and get a proper appeal channel, and get the kind of consideration for individual rights which I am sure was intended, we are in good shape. We just went too far.

Senator MONRONEY. You don't mean get back in, do you?

You mean get out?

Mr. HARTRANFT. I did not hear you, I am sorry.

Senator MONRONEY. You do not mean get back in, which would indicate that you want to return to the system that we had had since 1938, which I think the testimony has been rather clearly developed was the same system when the CAB made the rules and when they heard the cases and levied the fines for offenses against their own rulemaking.

Mr. HARTRANFT. I don't agree with that, Senator. I am sorry. I don't agree with that. When the Civil Aeronautics Board staff was doing that, and there was a hearing over there, or take the matter of rulemaking, the safety staff of the Civil Aeronautics Board would prepare the rulemaking.

They would do this with the advice of counsel, and would go before the Board. At that point the Board viewed the rule not as a fait accompli. If you had a complaint it could be taken and it was heard. I think——

Senator MONRONEY. That is not what I am talking about. I quite agree and have said so repeatedly in these hearings, that preconferences before the fact would be important. What I am talking about is the safety rules were made by the CAB, according to your witnesses, and I think at least made with the sanction of the CAB where they were made with the CAA.

But the rulemaking, safety rulemaking authority heard the case and delivered the penalty under the CAB rules when they had charge of this, the same as the FAA today makes the safety rules and hears the case and levies the penalty.

Mr. HARTRANFT. I am not clear on what your question is, Senator.

Senator MONRONEY. You said that you want to get back into what we had before?

Mr. HARTRANFT. Yes, sir.

Senator MONRONEY. What I am asking is do you want to go back to——

Mr. HARTRANFT. What I am trying to introduce, and which I think I have repeatedly indicated in the testimony to the best of my ability, is that we do not want one man making the rule, making the arrest, trying the case, passing judgment on the accused, and passing judgment on the rule of which he was the author. This is concentration of all powers in one man. We are trying to get a separation of these powers, so that the individual does have an avenue of appeal other than from the single entity from which the whole thing stems in the first place.

Senator MONRONEY. But you were content with the CAB making safety rules, and then hearing the case, and delivering the penalty under the old system; is that correct?

To me it is the same philosophy, whether it is the same man or the same board which makes the safety rule, hears the case, and delivers the verdict.

It is one and the same system.

Mr. HARTRANFT. Mr. Armour has asked if he may respond.

Mr. ARMOUR. I think I know what you have in mind, Senator. Theoretically, it is true that the Civil Aeronautics Board, under the 1938 Act, made the rules. And it was adjudged, when a case was presented for a violation of the rules, that the results were good for this reason: You did not have a one-man rule and you had a wholly different procedure, plus the effect of the Administrative Procedure Act.

Outlining it, it went this way: Under the 1938 act the Board did not propose safety regulations. The Board did not sit and wrestle with them and decide what they were going to propose. As a matter of fact, practice, and procedure and their outline of their method of operation, the Safety Bureau, the Chief of the Safety Bureau would discuss the rules with industry and with the CAA. There would be discussions and they would go over them carefully. Then the Safety Bureau would propose a regulation. The Civil Aeronautics Board did not propose it. The Safety Bureau proposed it.

It just happened that I happened to be there when we set that up, and they used to propose it by the Board and I said "Look, let's get away from this; let's do this in a much more simple way, and the Board can sit back and say 'We did not propose that; the Safety Bureau just went a little askew'"—so the Board could sit back and say what it would do about the rule and it did.

And when you had an appeal, and the Board had a hearing, you had a full-scale hearing in which all proponents, including the Safety Bureau, presented their evidence in support of the rule and were subject to cross-examination so that you could get a very thorough hearing.

That takes care of that. That explains the rulemaking.

Now, with respect to enforcement, the Board did not hear any cases. The Board never sat and heard a safety case. It may have, early in the days, but it did not in the 1938 act.

When the Administrative Procedure Act came into effect, it was essentially prevented from hearing. But there was not any change in the practice. I happened to be there during those years

The examiner, just as independent as a judge—and I may be biased or prejudiced but I will say that you will never find a better set of judicial officers than those safety examiners, and their record will stand against anything you want to put them up against—those safety examiners heard the case just like a judge.

The Board did not hear it. They decided it. It went on appeal to the Board. When it came to the Board, the Board did not hear evidence. The Board only reviewed the record to see whether the record was fair, like an appellate court.

Senator MONRONEY. As I understand it, then, this is a subagency or department of the Civil Aeronautics Board, the safety rulemaking branch originated the rule and it passed it up to the parent of the organization, the Civil Aeronautics Board itself, but they were still the safety rulemaking group and were under the direct employment of and the direct control of the members of the Civil Aeronautics Board.

Mr. ARMOUR. That is true.

Senator MONRONEY. Tell me the difference in the process today.

Mr. ARMOUR. Under the present process you have one man to start with, which is as different as five different men can be.

You have one man. One man sits and he decides that we are going to have a rule. He does not have to——

Senator MONRONEY. Does he originate all the rules? Or does he have a department in his shop to consider rulemaking?

Mr. ARMOUR. They are not proposed under the safety regulation division or any division. He proposed those rules and he is responsible for them.

Senator MONRONEY. What I am getting at is the actual mechanics. The Administrator's names goes on everything just the same as the rule goes on everything by the Civil Aeronautics Board. The subagency originated rulemaking in the Civil Aeronautics Board.

It was passed on up and ratified by the members of the CAB. What I am saying is, does Mr. Quesada sit there and type out or dictate the rules himself, or does he have, like the CAB had, a rulemaking branch which gives study and thought and legal composition to the rule and then passes it up through the line of authority to a review or consideration somewhere at the top of these proposals?

Mr. ARMOUR. I am sorry I can't answer that. I just do not know all the processes they follow in doing it.

But one thing is different. The Civil Aeronautics Board did not propose the rule. Their Safety Bureau proposed it. Under this administration the Administrator proposes it. His staff does not propose it. Maybe it is true that it comes up to him through his staff and goes through a lot of processes.

I assume it does.

Senator MONRONEY. Not the same number that must have come up through the Examiner or those reviewing the original proposal as you said of the safety branch.

I presume he has the safety branch down there that is concerned, too, with this matter of safety?

Mr. ARMOUR. Yes, but it has just this vital difference, as demonstrated in these hearings: When a rule was proposed by the Safety Bureau of the Civil Aeronautics Board, the Civil Aeronautics Board

was not bothering as to whether it had to sustain its rule or not. It did not propose the rule. The Safety Bureau proposed it. They got all the comments, and most of them went through—there were very few public hearings. Very few requests for them.

But the Board could sit back there and was not troubled with the problem that it had proposed this rule and somebody was attacking it. It had not proposed any rule. It only adopted it when all the comments were in and everything was satisfactory in a general way and it could justify it.

The Administrator on the other hand, when he proposed the rule, it is his rule. He has assumed responsibilty for the proposal of it and he does not look with any degree of equanimity on any one who attacks that rule.

Senator MONRONEY. Then the burden of what you are saying is that under the original act the Civil Aeronautics Board itself had evidentiary hearings as to the rule, the wisdom of it, and the effect of it, before it became a rule; that under the present method the rule coming up through the Department becomes a proposed rule by the Administrator himself, and that evidentiary hearings are not necessarily required or under custom perhaps do not take place on this rule. Is that correct?

Mr. ARMOUR. That is correct.

Senator MONRONEY. That is what I was trying to focus on, the difference, so we could have it on the record.

Mr. HARTRANFT. I think a good example of that was the statement made by a witness for the FAA here, I believe on the 12th of January, when Dr. Goddard testified.

In response to a question he gave you a date when they were going to implement 59.2.

Senator ENGLE. Sure; he told us it would be effective in July, and spoke of it as if it was a fact, and was briefed and ready to go notwithstanding the fact it was only published.

Mr. HARTRANFT. That is right. We asked for a hearing. It is very obvious there is no point in our going to a hearing there where they have already made up their mind.

They have indicated that to you right here in your own committee. This is the kind of thing that we are dealing with.

Senator MONRONEY. And the time for appeal is still running?

The time for submission of data?

Mr. HARTRANFT. My point is that you do not have an evidentiary hearing.

Senator MONRONEY. That is what I was asking you to clarify. The point is, I am asking now to have you clarify, whether the time for your filing whatever comments you have against the rule, has it expired?

Mr. ARMOUR. No, sir.

Senator MONRONEY. It is still open?

Mr. ARMOUR. It is still running. There is set a hearing for the 14th, I think, and it interfered with this. We asked them to continue it. It is set now for I believe February 11, a hearing on this. I was not here, but I understand they have already decided what they are going to do, so what are they giving us a hearing for?

Mr. HARTRANFT. They stated this on the record.

This is the uselessness of the type of hearing FAA is offering. They make up their mind.

As someone said, I have made up my mind, stop bothering me with the facts.

Senator MONRONEY. In other words, you feel that there is a futility in submitting anything if the witness has said that this will take effect on a certain date.

Mr. HARTRANFT. I think they have demonstrated that before your own eyes.

Senator MONRONEY. And they have no open mind on that?

We thank you for that point that you have made.

One point, before I leave. I got into this matter of the 3,884 violation reports received, with civil penalties of 1,093 taken, and the other actions. For the hundreds of thousands of plane hours flown I would like to say that this is perhaps a new low in traffic violation cases measured by the number of violation cases that generally occur in the automobile field, which would illustrate that your pilots are much more observant of rules than any other class of transport work.

Mr. HARTRANFT. As I said, Senator, I think the average person who flies is a pretty conscientious fellow. Last year when he bought a personal type aircraft he put out an investment, an average investment of over $20,000.

Here is a man who is flying himself, often with his family. He is normally trying to be as prudent as he can be.

The minute anybody comes along who is a rotten apple in that barrel, we are out there just as quick as the FAA, trying to get that man out of the air.

A part of our membership has an automatic insurance feature. We are not interested in carrying a boy along who is trying to cut corners. Our interests are identical to the FAA interests in trying to get increased safety. That is the part that hurts me about the type of accusation, as I understood it, that was made. I think it is simply a matter of misunderstanding. I repeat again, I have the greatest respect for the Administrator. I think that we are all working very much together on this. We ought to forget the skirmish and go on with our joint safety program.

Senator MONRONEY. Senator Engle?

Senator ENGLE. I want to compliment Dr. Hartranft on his very fine statement, and to say that I have belonged to his organization for a number of years, so many that I have forgotten how long it has been. It has been my opinion, and I have stated it time and again, that he has the best organization representing the private flier and the business pilot in America today.

I have never observed an instance in which I did not believe that the AOPA was trying to do a fair and constructive job in the field of general aviation.

I regret very much that in General Quesada's statement that he singled out the AOPA, along with the Airline Pilots Association, for a special lecture about pressure and all of that. I regret that the general is so thinskinned—and I suspect it comes out of 30 years' military life when he is used to having people say "Yes, sir," and salute.

These editorials are not mean editorials. I pointed out to the general that they were moderate in tone, in fact praised him.

If he had been in politics as long as any of us at the table here he would have been immune to this sort of thing. I think the time will come, as General Quesada has served a little longer in this office, that he will look back on the statement he gave this committee, in which he made the broad gage and broadside declarations against major groups vitally interested in the aviation industry today that ought not to be included in the statement made by a man representing a major Federal agency.

It is too bad that you had to take the time in your statement to refute some of those things and to mention them at all. I would say that you offer no better evidence of what the AOPA is trying to do, than what you did on your own initiative in connection with this 180° rating.

Some of us who have been flying for a long time got scared bad enough a time or two that we went ahead and did this long before you came up with this program.

But it is one of the best things that has been proposed. I observe that your organization has been supporting some training for private pilot licenses at least to the point where they can turn around and get out of weather, notwithstanding some complaint, as I understand, from some of your own membership.

We have covered this matter of rulemaking pretty carefully. You have discussed many times, and your organization I know has recommended on many occasions, the improvement of visibility in aircraft. I would like to ask you if you have ever made a recommendation, or if your organization has ever considered recommending to these private plane manufacturers that they get us a plane so that we can have a rear view mirror?

Nobody is going to get me when I can look out front, because I am just like an owl on a fence post, my head turns so fast, to keep out of their way. But we have blind spots behind us.

These fast jets and fast airplanes can run over the top of you. If they do not hit you their turbulence can turn you over. I saw an illustration in the Pilot magazine a while ago where a Tri-Pacer disintegrated in the air for no apparent reason, and I suspect, and the report seemed to indicate, that he had passed in the proximity of one of these fast-moving jets. You can't avoid that, and you can't avoid all accidents, like going out here on the highway. But it would sure help us if we could see backward as well as forward.

Have you ever thought anything about that?

Mr. HARTRANFT. Senator, first thank you for your very kind words. It is better than a raise. I very much appreciate what you said not only for myself but for my hard-working staff who are really very dedicated to their work for the improvement of general aviation, and whose greatest interest is the safety end of this.

Concerning the rear view mirror, I will have our service department immediately advise you of one or two manufacturers who do at the present time have such an accessory which I believe in your particular type of aircraft that you are now flying is a standard installation.

I will see that you have that.

Senator ENGLE. I would be very interested in that.

One other thing in your testimony that interested me and always has, and I am sure it is something that the average person and the public does not know, and that is the amount of private flying in this country as compared to commercial and military aviation.

If you listen to the average person in the country they think that the only people of any importance up there in the air are the airlines, and perhaps the military.

One set of figures you gave here was very revealing, and that is that 96 plus percent of the airplanes flown are in the general aviation fleet, and only 1.8 in the commercial airlines.

Do you have any way of comparing the total hours flown and the total miles flown?

Mr. HARTRANFT. We have the plane-miles, which is in the statistical handbook of the FAA.

Senator ENGLE. Would you put it in the record?

I think it would be a good addition to this record.

Mr. HARTRANFT. Yes, sir.

Senator ENGLE. I would like to see this information emphasized. We are spending hundreds of millions of dollars to build control systems, airways, and whatnot, for the benefit of 1.8 percent of the airplanes, and often ignoring the interests and the requirements of general aviation which exceed that of the commercial airlines in total investment by many times in number of airplanes.

It seems to me that public thinking ought to be reoriented just a little bit to the idea that maybe it all ought not to be done for the commercial aviator, that is, the airlines; that the business and the private pilot ought to have some very substantial consideration in regard to the rules and regulations made and the facilities made available so that they will be workable for him.

I picked up the radio facility chart for the Washington area. You have to carry a book, a library, with you these days to be able to fly.

You mentioned also the low level jet flights. I took that up with the Air Force. They informed me that it is a very necessary matter to train these pilots in low level navigation. They get used to flying at 30,000 and 40,000 feet and maybe higher and they have radio contact with everybody.

But they found out that radar can detect those fellows up there, whereas if they are right down on the deck it is hard to catch them. As a consequence they are training their pilots for these low level attacks. They say they have to teach them to navigate because they are not used to doing what we bush pilots do all the time; look at the sectional map and look down to see if we can see the road, barn, peak, or whatever it is.

They are trying to teach those fellows a different sort of orientation, especially at high speeds and low level and over great distances.

They need to teach them how to do that. I asked them if they were getting out of congested areas and they showed me the places where they run these low level flights.

I asked them if they do it over water and they said they couldn't because it doesn't involve the same problems. Do you have any suggestions to offer as to how they can accomplish this training and minimize the hazards to general aviation?

Mr. HARTRANFT. Only this: There is a lot of airspace tied up by the military which is pretty much exclusively theirs. It seems hard to me to justify a flight which will cross 33 civil airways when we have so much terrain which could be used and not require the flight through a congested area.

As you well know, your own good State of California probably has more airmen and more aircraft—and the greatest number of AOPA members, incidentally—than any other State.

Ohio is another high State. Ohio was one of the States chosen by the military to run these flights.

We certainly got a great many miles of sparse area which could be utilized by the military. I wouldn't feel qualified to comment beyond that because I am not familiar with the operational problems of the military, Senator.

We also have a lot of space in Alaska now that has a lot of terrain and very few airways, for instance.

Senator ENGLE. That is possibly a good suggestion.

They have to fly some distance. These military reservations of theirs may be 100 or 200 miles, but flying at the speeds they do, they don't get much training or they would be chasing themselves around in a circle.

They want a little longer range navigation.

Assuming the military requirement, it seems to me that we ought to be prepared, if we object to what they are doing, to come up with a suggestion that would enable them to accomplish their training mission and at the same time minimize the risk to general aviation.

I would welcome any suggestion you might have on that. I don't see why they can't get some place else. They probably could send their fellows up to Alaska. I don't know. I would like to find out about that.

Mr. HARTRANFT. My point is that the requirement for it doesn't make it safe, Senator.

If they collide with somebody, whether it is our people or an airliner, we are not going to be talking about what they have to do to train their pilots. We are going to be talking about the safety involved and why such a thing was permitted.

It is either safe or it isn't safe. My point is that if it isnt' safe—and we think it isn't—it shouldn't be permitted to be done as it is. What they do about it or where they take it I do not have the knowledge or presumption to say.

Senator ENGLE. Getting to your recommendations on page 9, could you put your finger on those that have been initiated? I think you have 11 separate recommendations there.

Mr. HARTRANFT. I indicated that on the cockpit visibility standards, as far as being a mandatory requirement, nothing has been done.

I think it is easier to go over the ones in which something might have been done.

Senator ENGLE. That I would like to have you do.

Mr. HARTRANFT. On 2 we have them in high density zones only.

Nothing on 1, nothing on 3, nothing on 4. On 5, I think that was covered in previous testimony, jet flying above certain altitudes, and a program for implementation. Something has been partially done on 5.

Senator ENGLE. You mean flight recorders?

Mr. HARTRANFT. Yes.

Senator ENGLE. What do you mean by a collision warning device? Are you talking about a flash beacon or something of that sort?

Mr. HARTRANFT. No, sir. A collision warning device is something in the cockpit of an airplane which will detect the presence of other airplanes.

Senator ENGLE. Are you talking about radar?

Mr. HARTRANFT. That is one of the techniques. FAA has I believe a considerable research program. We are participating on one of their committees to find the techniques for putting in and improving such devices.

Senator ENGLE. Your No. 7, why do you refer to the Century series? Wouldn't the Boeing 707 and Douglas C–8 be in the same category?

Mr. HARTRANFT. No. We are talking about a one-pilot high performance airplane here, Senator.

Senator ENGLE. Have they done anything about that?

Mr. HARTRANFT. I was interested in Mr. Bakke's testimony in which he said I think under your questioning that he felt that—what was the exact phrasing?—that two pilots were required in all high performance jet aircraft.

I was going to pose a question the next time I saw him, what about these Century series aircraft; did he include those or not, because it is perfectly true that they do have many of the same flight characteristics, they are many of them capable of exceeding the sound barrier and causing the sonic boom type of phenomena which I described earlier in my testimony.

In many of these Century series the pilot simply can't see where he is going. He is a projectile which is really being controlled pretty much from the ground, and not a good neighbor in common-use airspace.

Senator ENGLE. The jet penetrations and high speed climbs, you may recall a time when they had——

Mr. HARTRANFT. We are having a problem with those, Senator. For instance, here, locally at Andrews Field, there is supposed to be a provision that you can communicate with the Andrews Field in order to fly your aircraft in the areas which have been designated.

We have still been unable to get the communications latch-up working on that. We have filed how many letters?

Mr. KAYNE. Five.

Mr. HARTRANFT. We have filed five letters and are still working on it. There are some real problems.

Senator ENGLE. Do you know what frequency they give you?

Mr. HARTRANFT. They are supposed to guard the civil channels. This is the problem. They are not doing it.

Senator ENGLE. I think those corridors are a good thing, but as I said to General Quesada, it seems to me that they ought to have a corridor on each end. If you look at that situation you think you can fly around the south end of Andrews and some fellow is driving right down your neck because he is coming in on their landing pattern.

Mr. HARTRANFT. I believe you will find in some cases they are using reverse techniques on that.

Mr. KARANT. On Andrews, they have an assigned civil frequency. The theory is that you are protected, that corridor is closed so long as it is being used and you can be warned to stay out of it. It is protected with the civil frequency and all you are supposed to do is call in on the radio on this frequency and ask if there is any jet traffic.

My personal experience has been, I think I made 25 or 30 calls in the last few weeks, and I have yet to get an answer from anybody.

What this means in reality is that the corridor is closed to civil air traffic. If they don't answer you, legally you can't go through. Also I think the case is legally they don't have a corridor. We are still trying to work that out. We have sent five letters to the FAA that I can recall, reciting 25 or 30 instances, and haven't heard a word yet on any of them.

Incidentally, we have this problem in many parts of the country. These jet corridors appear all over the country now. It is a protective device for the Century series fighters. We have had reports from members in many parts of the country that they have tried to call to get information to see whether it is safe to fly through, and they don't get answers.

Fortunately, we can call the FAA nearby and they get on the interphone and call up and ask why they are not answering the calls.

Senator ENGLE. Isn't it more sensible to go into the corridor at a distance out?

Mr. HARTRANFT. Those corridors are stepped up, a certain distance out. They ladder up. Usually you fly under it, and further out you can fly still higher.

Senator ENGLE. That is correct. And I understand you are not in violation if you do that.

Mr. HARTRANFT. That is correct.

Senator ENGLE. It would seem to me, on this point, that approach corridors would be very important. I mentioned to General Quesada, who took some training, as he said, at Castle Air Force Base, those B–52 make their turns 7 miles out. I would like to know where they are, so I can stay out of there.

Mr. HARTRANFT. On these collision courses, collision accidents, which I quoted in my testimony, there is one thing that runs through all three, namely, that the military aircraft flying in formation which hit the civil aircraft was in no case the lead plane. He was a plane flying wing. In other words a man concentrating on looking at the plane that he was hanging to. In all three instances they were knocked out by the man who was too busy flying formation to have the time to look out and see what else was in the airspace with him.

And that is why we very urgently ask that no formation flying below 15,000 feet be allowed in common use airspace.

Senator ENGLE. That is item 10?

Mr. HARTRANFT. Yes, sir.

Senator ENGLE. No. 11, haven't they permitted "fighter break" approaches on all joint use airports?

Mr. HARTRANFT. No, sir.

Senator ENGLE. They have not?

Mr. HARTRANFT. Not to my knowledge.

Mr. KARANT. That was what happened at Mansfield.

Senator ENGLE. Where?

Mr. KARANT. Mansfield, Ohio. There was a "fighter break" operation, and the Tripacer was hit at an altitude of about 1,500 feet. He was cleared to make this break by the tower. He pulled up and hit the Tripacer out away from the field.

Mr. HARTRANFT. That happened in the last 5 months, all three of those accidents.

Senator ENGLE. Would you like to summarize, 1, 2, 3, your legislative recommendations, so that in the record at one place we will have them summarized?

Mr. HARTRANFT. Senator, I have indented in my testimony those portions in which we have asked for specific changes to the act. Those indented portions appear on pages 16, part 601(d)——

Senator ENGLE. That is the provision for review. It is discretionary, as I understand, by the CAB. It may review any rules, standards, or regulations, is that correct?

Mr. HARTRANFT. That is correct.

Next is page 19, section 901(a)(2).

Next is page 20, section 301(a).

I think those are the three I indicated in the early part of my testimony we had three areas we felt revision was necessary.

Senator ENGLE. Thank you very much.

Senator MONRONEY. Senator Cotton?

Senator COTTON. I want to straighten out one or two things in my mind. I didn't hear all of your presentation, but I have read most of the statement.

I thought that the statements on pages 5, 6, and 7, regarding General Quesada and his problems were especially fair and dispassionate and in a restrained manner. I think you should be complimented in approaching his objective on that.

However, I did—after reading those pages, and hearing your testimony here, and hearing Senator Engle's characterization of the articles of your own magazine, which I have read in part, and which I would agree with him on the parts I have read, I have here a release, a joint release from the ALPA and the AOPA which does not bear a date but which was received by one of my colleagues. It is stamped as having been received January 8, 1960. Are you familiar with the release?

Mr. HARTRANFT. Generally I am; yes.

Senator COTTON. This release says:

> Opposition to the "arbitrary and militaristic empire" created by and presently operated by the Federal Aviation Agency has reached a point where two diverse segments of civil aviation, general aviation and the professional airline pilots, have joined forces in combating the problem.

Then it goes on to quote your president, Clark E. Luther of the ALPA as saying:

> The current theme in FAA rulemaking seems to be best described by that witty card often seen posted in offices, "Don't confuse me with the facts, my mind is already made up." We intended to do whatever we can to take this issue to Congress this year. It is imperative that we have restored a system of checks and balances which will preserve the rights of citizens engaged in the aviation industry and governed by the Federal Aviation Act. We think the FAA's present way of doing business is arbitrary and unprecedented in the U.S. Government.

Then speaking for AOPA President J. B. Hartranft, Jr. said:

> The attitude that is apparent among FAA officials today has no place in the American system of government, where checks and balances have always been provided and must be provided here. Today we find ourselevs deprived of any effective appeal to any arbitrary rulemaking of the FAA. The situation has become so serious, and denial of evidentiary hearings has become so commonplace with the FAA, that it has united the efforts of many segments of civil aviation into an almost solid front.

There is nothing objectionable in that release, except it seemed to me to be a much stronger statement than your statement given to this committee, and a much stronger statement than the statement in the editorials. I thought that I would read it into the record.

Have I characterized that properly? Do you disagree with that characterization? Isn't that more calculated to irritate this situation than your very fine testimony here and these articles in your magazine?

Mr. HARTRANFT. Senator, I think that we have at no time, endeavored to irritate any situation.

We have an awfully big stake in this. We are trying to get along.

I have stated that I feel that Mr. Quesada, who in his own way is doing exactly what he, Mr. Quesada, feels he should do and must do under the act. I have indicated that I think he is very able.

I have indicated further that I think that our quarrel is to get the act changed, which then means that Mr. Quesada will have a different set of rules to operate under, and this will remove any of the areas in which we have had differences.

Actually I must confess to you that the last word I had from Mr. Quesada was a letter in which he expressed appreciation over the fine editorial support he was getting on the safety program, and that was a letter of about 5 months ago.

I did not know of Mr. Quesada's displeasure, and I am prone to think it was simply a matter of frustration of his duties here. I think I have already covered that ground pretty well.

Senator COTTON. I don't think this committee should interest itself particularly on who is pleased or displeased. I think that it should meet this thing objectively as you in most of your statement have mentioned.

I want a couple of things straight in my mind.

What do you feel is necessary to have a fair act under which you people can work and have a fair hearing? You are most interested in appeal after the order has been published and made known?

Mr. HARTRANFT. No, sir; definitely not. This is the trouble. We want a review of rules before the rules are published. This is simply the theory that if men of good faith gather around the conference table, they are going to come out, usually, with something in the way of a good rule and as much fairness to all as is possible for men to accomplish. It is only when one or the other of the parties closet themselves, complete their staff work, make up their minds, publish their intended rules, that they put the other party in a position where they have to be an adversary. This is not the proper way of doing it.

Senator COTTON. May I suggest this to you——

Mr. HARTRANFT. In other words proper coordination prior to making the rules, an appeal of civil penalties, and a review of the reules with respect to the content and fairness of the rules.

Senator COTTON. My question was based on your suggested legislation on page 19 of your statement; which incidentally, as one member of the committee, and talking off the cuff, appeals to me as very worthy of consideration by this committee. That is in the nature of an appeal not on the administration of the rules but the rule itself.

Your suggestion that what you want even more is to sit around the table with the FAA when the rules are being formulated causes me to raise this inquiry which I think we have to consider.

One, the Coordinating Committee in the House of Representatives, the Interstate and Foreign Commerce Committee, the Committee on Oversight, has been having hearings over the past 2 or 3 years, in which they have turned the light pretty strong on this matter of influencing governmental agencies. It is getting so that a Member of Congress, a Senator or Representative, has to hesitate before he attempts to deal with any Board downtown, because he is liable to wake up and find that he is going behind the scenes, he isn't dealing in controversial matters, he isn't writing a letter and having a copy of the letter sent to all interested parties.

I wonder if, when we get back into a situation where Congress creates the FAA to do a certain job, and then interested parties sit down with them while they are doing that job around the table, in informal conferences, just where we draw the line on that.

In the second place, I agree with you thoroughly that there is no sense in having a hearing after everyone has a closed mind. But forgetting for the moment the personality of General Quesada or any other man who may be doing this job, I would want to know as a lawyer, from the days that I was a country lawyer and practicing law, what I was shooting at.

I question whether the Administrator of the FAA is going to be able to do his job if he calls in everybody, all the interested parties, if he calls in representatives of 40 organizations and says, "We are thinking about some kind of a rule to deal with such and such a problem; let's all sit down and discuss it." I think plenty of people could be killed in accidents before they ever came up with anything.

If you know exactly what they had in mind, and you have something to shoot at, and then you have the opportunity for evidentiary hearings before it goes into effect, and then you have an appeal to the CAB after they go into effect—before or after—it would appear to me, offhand, as being much the same course than to have this method of getting together in advance. Who is going to get together? What organization will be invited? How many? How big?

Do you see what troubles me?

Mr. HARTRANFT. Yes, sir. We are talking theory now. Let me speak from experience. The Radio Technical Commission for Aeronautics, which is composed of industry groups and Government, including military, were the ones who, behind a great deal of hard work, originally conceived our common system of air navigation as we know it. I was privileged to be a member of that group which received the Collier trophy award. Mr. Truman made the presentation. At that time he eulogized the working relationship which has been established between industry and Government for getting a very complex air navigation system formulated in such manner that all users of the airspace—air carriers, the military, the private flyer, the commercial

flyer—all had the best they could get out of the system and yet have a common denominator.

This committee knows, as well as I do, what happened after that was all set up and how we got off the track, when a Government agency started to make the rules itself; we got into the tag end of the controversy which cost the taxpayer millions and millions of dollars, simply because they refused to sit around a conference table and talk about their requirements.

If I understand your requirements, and you understand my requirements, and we have a common interest in safety, and we are fair minded men, we are going to come out with a better rule, I maintain, than anybody that tries to operate in a vacuum or in a closed door and tries to outguess all of the things that can come into rulemaking in so complex an industry as the one we associate ourselves with.

We feel that prior coordination before rulemaking is necessary to initiate the full knowledge before the proposal. This is evidenced almost on a daily basis where somebody will come up and say I think we should require a rule that all airplanes will have fluorescent painting. We are well on the way to getting fluorescent painting on airplanes simply by volunteer efforts, by the publicity the industry gave us, that it is a good thing to see and to be seen.

Unknown to us or anybody in the industry the rulemaking boys got busy and put out a proposed rule on this thing. It had a lot of bad points. So we ended up in a situation where the program has been almost totally dropped. The rule didn't get through because we came in and found that the paint had certain problems with respect to applications on certain types of fabric, that there were certain fade qualities and so on and so on, apparently not known to the people writing the rules. But they got this knowledge finally the hard way when the industry came in.

We could have saved ourselves a lot of problems, the Government could have saved themselves some problems. All we ask, Senator, is to talk it over, so that they at least have the benefit of all the knowledge which is available from industry. I don't believe we have ever gone on a project that has been a worthwhile project where industry hasn't been cooperatively a part of the situation. That is why we have boards of direction in management, simply because no one person or no one group has all the answers.

Senator COTTON. Let me ask you this: If a rule is going to be considered that is of far-reaching effect on flyers, which is of interest to the airlines, the pilots, to both general and commercial aviation, how many different organizations are there, that, in order to treat everybody the same, would have to be called in, would sit down on this preliminary discussion before anything was formed?

Mr. HARTRANFT. Senator, there is machinery set up for that. I think the Administrator is aware of it. Organizational groups themselves——

Senator COTTON. Set up by whom?

Mr. HARTRANFT. Let me illustrate. There was a time when it was necessary to set up a system of priorities. An aviation council was immediately formed by the industry at the request of the then existing Administrator, and the job was done. There have been many

calls through the years for many jobs to be done. I have indicated the job of setting up a common system of air traffic control.

This is no great problem, sir.

Senator COTTON. We have a problem to phrase legislation. If this committee attempted to phrase some kind of legislation that would compel or make it necessary for the Administrator to give an opportunity for consultation to interested parties before the proposal, the formulation or proposal of rules, this committee would have to pretty near find out how many organizations there are, both big and small, because in writing a statute you have got to provide for everybody being taken care of, and you can't leave anybody out.

It would seem to me that that would present extreme difficulties.

Mr. HARTRANFT. Let me answer you two ways. You probably have a list here of about 6 to 12 such organizations to appear before the committee on this important piece of legislation, on the testimony before the act itself. That is not a very large number of people to deal with.

Secondly, let me point out that in our recommendation we have only gone so far as to say please tell the FAA that it is all right with them to talk to industry groups. They have a different idea from the present wording in the act.

We in industry will accept the responsibility to see that we have made the necessary arrangements for that, if you can just tell them that it is all right, it isn't a sin for them to talk to us.

Senator COTTON. Are you quite sure that 1 year from today there wouldn't be somebody in here perhaps who hasn't come in today to say, "You told the FAA that it is all right to consult people before they act, and they have consulted so and so and so and so and this and that organization, but did they consult us? No." And they have been discriminatory.

Mr. HARTRANFT. In that case, Senator, I think you perhaps might do what my chairman of the board does when a similar situation comes up. He says, "Have you talked to the general manager or the president?" I think, sir, if the complaining party were asked, "Have you talked to the Administrator" or told "Go see the Administrator about it," I am sure that Mr. Quesada's door is always open. I don't know of any CAA Administrator who has occupied that post who has been unavailable to anybody within reason, who had any interest in any subject.

Senator COTTON. You mean his door is always open when, now? I understood his door was closed.

I understood you to testify his door was closed.

Mr. HARTRANFT. Mr. Quesada is under the impression, I believe—I want to leave the personality out of it, I think we are agreed——

Senator COTTON. I respect that.

Mr. HARTRANFT (continuing). That expediency is the common denominator; that the authority is vested in one place; that the action should be taken, and there is no requirement that anybody be hurt.

Now, I think the gentleman has been very frank and candid in response to Senator Engle's question, "Would you go along with the idea that the Board can review your actions?" He said, "No."

I think I am expressing that correctly, am I not, Senator Engle?

Senator ENGLE. That is right.

Mr. HARTRANFT. We have never had trouble coordinating in the industry, Senator. I don't think that is a problem. We may agree to disagree between groups in the industry, but, by and large, given a job to do, we do it.

Senator COTTON. If this is going to be open to the interested parties in industry before the FAA sets up a rule to shoot at—we will come to that in just a second—on this matter of getting in and talking about it before they formulate it, if it is going to be open to industry, it is my impression that there are some 22 listed organizations, but that is neither here nor there—how about the rest of the interested parties, the military, the Army, the Navy, and the other governmental organization? I am disturbed about this matter of holding a mass meeting before you write a rule to consider.

Mr. HARTRANFT. I think to get anywhere on this we will have to take a sample of the type of rules you have proposed.

I have indicated that the industry is very highly organized. The Military Establishment has never had any difficulty, that I know of, to be heard on any regulatory matter. I am not sure that I understand just what you are getting at, Senator. You seem to feel that this would be placing a too great a burden upon the Administrator to talk to anybody before he wants to make a rule.

I can only answer you by saying that to my judgment, by past experience is that this is not so.

If you want to go into names, perhaps this is the way to clear it up. You have the Air Transport Association representing the airline interests; you have the Airline Pilots representing the airline pilots; you have our own group, and I have indicated in here that our group flies 56 percent of the total of the general aviation fleet. You have heard from Mr. Lawton, who is with the NBAA. You have heard from the irregular air carriers groups who have a spokesman, and so on.

You will get into some organizations where the whole group consider themselves general aviation are only 13 in number, and that includes everything——

Senator COTTON. I don't want to take too much time, but this is the sort of thing that is difficult for some of us to realize. Here are these organizations: Airspace Industries Organization; Airline Dispatchers Association; International Airline Pilots Association; Airline Stewards and Stewardesses; Association of Local Transport Airlines; Airport Operators Council; Aircraft Owners and Pilots Association; Air Transport Association of America; Air Travel Control Association; Civil Aviation Association; Flight Engineers International Association; Flying Physicians Association, Inc.; Flight Safety Foundation; General Aviation Council; National Association of State Aviation Officials; National Aviation Trades Association; National Business Aircraft Association, Inc.; National Flying Farmers Association; National Pilots Association; Transport Workers Union, Air Transport Division.

Undoubtedly some of those might never be interested in certain rules, might never raise any objections. I want to give absolute consideration to your interests in this. I can see where you want to make sure that where a rule is promulgated that you want an opportunity to be heard. I am for you clearly in your suggestion

that there ought to be a review and appeal. But in the light of this suggestion that at the beginning, when you are getting together to formulate a rule, to consider a question, to get it together, and when you are dealing with a situation that involves the safety and the lives of millions of the public and requires that you get somewhere within a reasonable length of time, it is inconceivable to me at the present moment how anybody could sit down and, first, how Congress could formulate an act that would insure all these people that no one would be deprived of the opportunity to sit in at the inception, and how any human being could ever accomplish anything, get anywhere, if they had to consult all these people. That is the problem that is troubling me.

Understand I am restricting these questions to this business of having a chance to sit down with them, having a right, having a right to sit down with them before they even write a rule.

Mr. HARTRANFT. Senator, I understand what you are talking about. I can't conceive of any rule that would have all those people interested in it. The question is, Was it the intent of Congress to restrict the FAA in obtaining the best possible information prior to decisionmaking? This is the only question.

They apparently have interpreted your act that they were. We understand the act that they were not. In order to clarify it as to which way the Congress really meant it, we have come to you and we have said to you, "Look, if you did mean that the FAA was restricted with respect to that, all right. Leave it as it is. If you meant that they were not, put something in there that will tell them," and this is permissive—our language is permissive, to say "that you can, and nothing in the act means that you cannot." Because their people are telling us now that they cannot. This is the only question involved.

This is a permissive step.

Senator COTTON. If you put in this permissive step, it is bound to mean that they can and that they have the power to choose whom they shall select.

Don't you fear that power a little bit?

Mr. HARTRANFT. We will take our chances with that.

Senator COTTON. You really feel that that is not to be feared, that the situation, as it now exists is worse than the situation where you might have the kind of an Administrator, an arbitrary Administrator, who just says "I can listen to you but I won't listen to you"—and he has the power to do it and Congress says he may?

Mr. HARTRANFT. I have just cited to the committee exactly what is happening now. I think you can judge that as well as I can. They are going ahead with rulemaking.

You have been told I think by every witness that I have heard here, that they are having difficulty on this situation. Rules are coming out that have no rhyme or reason. Although this could have been taken care of if the FAA simply would allow the mechanism for getting opinions from representative associations, or individuals, who have a knowledge of the text of the matter, and that it would smooth the way for the handling before the public announcement of rulemaking.

I think the Administrator has to use his discretion, but if he selects a "but not be," this is not something that should concern this committee, I think.

Senator COTTON. One more point. I think you have been very clear on this, and very forthright in your answer. He does, however—there is no question under the present act—if he desires, he can give you a hearing after the rule is published before it becomes effective. Right?

Mr. HARTRANFT. It is understood the Administrative Procedure Act is discretionary upon the Administrator to determine whether, by whatever he sets up as his determining criteria—whether or not he, the Administrator, decides that a hearing is necessary.

The type of hearing which is held now is quite a different thing from the type of hearing which was held before, as I have already made clear.

Senator COTTON. It is permissive. He can give you that hearing now?

Mr. HARTRANFT. Oh, yes.

Senator COTTON. But he does not do so, or the type of hearing that you feel ought to be given?

Mr. HARTRANFT. Sometimes he does not give any. And sometimes he does not—well, he is not giving the type of hearing in any case which we feel is necessary.

Senator COTTON. How can you take your chances, then, on a permissive act by Congress to let him call you in to sit around and formulate these rules when he does not exercise or make use of the permission we have given him to give you, according to your own feeling, an adequate feeling after the rule is formulated and before it takes effect.

Mr. HARTRANFT. We are talking about two different things.

Senator COTTON. We are talking about his discretion on one. Yet you feel he has not exercised it fairly on the other?

Mr. HARTRANFT. We are asking first that you clarify the intent of the Congress with respect to whether or not he can do so. We have asked for a permissive change in the regulation under section 301–A. It says "Nothing in this section shall preclude the Administrator from consulting with and obtaining the views of all interested parties, et cetera."

This was necessary because in the beginning, as the earlier testimony pointed out, there was the matter of the delegation of the CAA Administrator's statutory authority to the ACC. It was determined, and we were with you; we were completely in agreement that the Administrator should not be bound by the decisions of an executive committee, but in the language employed to rid ourselves of that evil there is now the interpretation that they cannot talk with groups such as ourselves, for instance.

It is mandatory that they abstain. The language we have suggested here is still conditional. It is still permissive. It simply tells them that if they want to, they can.

I don't see, as long as there is confusion—and I think the confusion has been demonstrated already on the record——

Senator COTTON. You are referring to the language which says:

In the exercise of his duties and the discharge of his responsibilities under this act, the Administrator shall not submit his decisions for the approval of, nor be bound by the decisions or recommendations of, any committee, board, or other organization created by Executive order.

Mr. HARTRANFT. Right.

Senator COTTON. Just one more question, and I am sorry to have taken so much time: You understand these are not hostile questions.

Mr. HARTRANFT. I understand perfectly, Senator. I am very glad to discuss them with you.

Senator COTTON. You, in response to questions by the chairman of this subcommittee, said, I believe, that Mr. Quesada in his own testimony before the committee indicated clearly that he had closed his mind and that a rule was made and it was going into effect regardless?

Mr. HARTRANFT. Yes, sir.

Senator COTTON. You had reference to the 60 years of age rule. I am not going into the merits of it.

Mr. HARTRANFT. No. The testimony I referred to is the testimony of the air surgeon, Dr. Goddard, in which he made a positive statement with respect to the effective date of a regulation. This is a regulation which they are supposed to be holding a hearing on.

I make the point that there is obviously no point in showing up at a hearing on something on which they have made up their minds. They have demonstrated before this group what the burden of the industry is.

Senator COTTON. It was not a statement by the Administrator?

Mr. HARTRANFT. It was a statement made by the Administrator's air surgeon in the presence of the Administrator which was not corrected or changed.

Senator COTTON. In connection with this other rule, on page 405, when Senator Engle was questioning Mr. Quesada—page 405 of the record, which I will be glad to show you—I note this language, which is significant—Senator Engle was examining Mr. Quesada in relation to the 60-year age requirement, rather the requirement against 60-year-old pilots:

How many 707 pilots over 60 years of age are you going to ground over the next few months?

Mr. Quesada's answer was this:

Sir, the rule which has been published, to be effective March 15—

and so forth.

Mr. HARTRANFT. We are not talking about that rule.

Senator COTTON. I understand you are not talking about that rule. You have made that clear. But I call your attention to Mr. Quesada's language, his phraseology. He said:

The rule which has been published, to be effective March 15.

This would seem to indicate that Mr. Quesada recognized that rule published, to be effective at a later date, that the delay was in order to permit affected people to file briefs and make their views known, and implied that he recognized that they should be considered.

He may have a closed mind but his language there did not indicate that he thought he had a right——

Mr. HARTRANFT. His language indicates to me that he is following out the requirements of the Administrative Procedure Act.

My statement was that the air surgeon made a specific statement on the record which is nothing like the language Mr. Quesada used, and that he indicated definitely a date on which this regulation was to take effect.

Mr. Quesada sat right alongside of him. In his silence I assumed that he was speaking for the Administrator.

Senator COTTON. So that you feel that Mr. Quesada's conception of this is that the rule is to be made without bothering anyone, and when it is published, it will take effect on the date so many months away and so many weeks away, and that that is it.

Mr. HARTRANFT. This has already happened. Let's take 59.1. We asked for a hearing on that, in every way we knew how. It was denied. If you would like the record on that we can give it to you.

Senator COTTON. Were you denied the privilege of making your arguments known?

You were denied an oral hearing. Were you denied an opportunity to file a brief on it?

Mr. HARTRANFT. Oh, no, we can always indicate what we want in a letter. But we were denied a hearing, a public hearing.

Mr. COTTON. Thank you, Mr. Chairman.

Senator MONRONEY. Thank you very much.

Are there any further questions?

We have two further witnesses.

We thank you very much, Mr. Hartranft, for the time that you have given this committee.

Senator MONRONEY. Mr. McMullen, we are glad to have you back before our committee. You have spent a great many hours in the witness chair before us on matters that are of vital importance to the aviation industry, and to those who participate in it. We are grateful to you for the contribution that you made to the Federal aid to airports and the many, many other worthwhile things. We are happy to have your comments on this matter of aviation safety.

STATEMENT OF A. B. McMULLEN, EXECUTIVE DIRECTOR, NATIONAL ASSOCIATION OF STATE AVIATION OFFICIALS, WASHINGTON, D.C.; ACCOMPANIED BY HAROLD VAVRA, DIRECTOR, NORTH DAKOTA AERONAUTICS COMMISSION

Mr. MCMULLEN. Thank you, Mr. Chairman.

I would like to introduce the gentleman with me on my right, Mr. Harold Vavra, the director of the North Dakota Aeronautic Commission, and one of my 42 bosses. He happened to be in town today on other business.

Senator MONRONEY. We welcome you to this committee and congratulate you on the progress of the airports and other things that you have managed to develop in your great state.

Mr. VAVRA. Thank you, Mr. Chairman.

Mr. MCMULLEN. Mr. Chairman, I realize the time is rather late. I have no prepared statement. I will confine my remarks, in the interest of time, to the subjects which have not yet been discussed before the committee during these hearings.

My principal reason for appearing before the committee is to invite attention to the fact that most of the states, through their State aeronautics commissions, have active and aggressive aviation safety programs. These programs of the NASAO and the States include among other activities the production and nationwide distribution of thousands of colorful eye-catching posters that are placed in aircraft offices, shops, and pilot briefing rooms, and other places where they may continuously remind all types of airmen of the need for conducting their work in a safe and efficient manner.

I have a number of these posters here which I will provide for the committee's perusal. The subjects indicate the type of activities that are emphasized. One is "Check your weather before you go." Also, "Keep legal distance from an overcast." "The pilot who says flying safety is for the birds," shows him cracked up against a stump. "Air safety is a matter of look, not luck."

Senator MONRONEY. We will receive them. If it is possible to reproduce them we will reproduce them in the record in black and white.

Mr. MCMULLEN. These posters, I might explain, one is distributed nationally each month by the members of the association to airports and places where they will be a constant reminder to people to fly safely.

NASAO and several individual States have produced 15- or 20-minute motion picture films, normally in color and sound, illustrating the right and wrong way to maintain and operate an aircraft.

The NASAO and several individual States annually award certificates and commendations to airports, aircraft owners, and airmen who have established outstanding safety records. Many States sponsor each year aviation safety courses and seminars, usually 2 or 3 days in length, which pilots can attend without cost, where they can become familiar with the latest CAR, air traffic procedures, and safety practices while refreshing their memories with respect to meteorology, air navigation and similar subjects.

The States, through their State departments of aviation and State police, enforce aviation safety rules and regulations and conduct aircraft accident investigations. These State enforcement and aircraft accident investigation activities are closely coordinated with those of the FAA and the CAB and in some cases they are carried out jointly.

Joint Federal-State working agreements covering safety and enforcement and accident investigation were implemented several years ago and they are currently being revised and updated.

I am assembling kits of material which I will make available to the committee members. It is mostly material I do not feel would be subject to esonomical reproduction in the record.

Senator MONRONEY. You might read the titles of the publications that you have.

Mr. MCMULLEN. They are "Pennsylvania Aircraft Accident and Violation Analysis," which is compiled annually by the Pennsylvania Aeronautics Commission. There is a case history of all the aircraft accidents that occurred in that State, and what step the State aeronautics commission has taken to prevent similar accidents in the future.

Another is an Illinois Aviation News Bulletin published by the Department of Aeronautics, explaining the details and outlining the program of a 2-day safety conference which is planned for January

29 and 30, about 2 weeks from today. I was told the other day by the State director of aeronautics that they had already over approximately 300 pilots enrolled. I will also include in the kit material from the Ohio Division of Aviation.

These pilots will be given a 2-day safety and refresher course in air traffic rules and safety procedures.

It might be of interest to the committee to know that in Illinois the State department of aeronautics provides Link trainer time to pilots who are interested in upgrading their instrument flying ability. The department has the complete cooperation and approval of the operators of training schools because they will not give this free time to the pilot unless he has purchased an equal amount of time from an operator or school that provides this Link trainer training.

I was very much interested in Senator Cotton's remark this morning concerning the need for improved research and rescue techniques in order to reduce the time often consumed in locating downed and lost aircraft.

In this connection I would like to present for the record a copy of a resoultion adopted by NASAO members during their annual meeting last year. The resolution is:

Whereas the record shows a tragic number of downed aircraft have not been located for long periods of time; and

Whereas in many cases survival of pilot and/or passengers has resulted from circumstances or skill of the pilot in executing an emergency landing; and

Whereas the rescue of survivors of some such emergency landings, or unanticipated crashes, has been accomplished only after endurance of extreme hardships, starvation, exposure, and/or suffering from injuries; and

Whereas in other cases, survivors have succumbed to the effects of starvation and exposure, or lack of medical attention, before the downed aircraft was located; and

Whereas irrespective of considerations associated with survival, nearly every State has experienced long, costly, and agonizing searches, often extending over a period of weeks, in an effort to locate a downed aircraft: Therefore be it

Resolved, That the National Association of State Aviation Officials—

(*a*) Urges the Federal Aviation Agency, and aircraft and radio manufacturers to expedite necessary research, development, and production of an economical and lightweight device which can be installed in, or on, aircraft to function as a radio "homing beacon" for searching aircraft and ground parties; such device should be capable of manual operation and/or automatic activation upon impact comparable to that encountered in a crash landing, and should transmit on a universal frequency with a range of not less than 20 miles; and

(*b*) Urges the FAA, and specialists in the field of chemistry to continue research for improved products and materials capable of generating smoke of high visibility properties, to be packaged in a device of a size and weight that can be safely and economically carried aboard or installed on aircraft for signaling purposes in emergencies; and

(*c*) Urges aircraft owners and operators to make maximum use of existing smoke and flare signaling devices.

We also suggested in a letter of transmittal that the aircraft owners and pilots be encouraged to carry in the aircraft at all times such survival and first aid equipment as the type of aircraft may reasonably permit. I am happy to report that since these hearings began we have received a letter from the Administrator of the FAA stating as follows, I quote several paragraphs from the letter:

The Bureau of Research and Development of the Federal Aviation Agency have been closely monitoring the developments mentioned in your letter and have initiated a project which will result in an experimental crash locator beacon such as is recommended by your association. In the area of smoke

generators, as an aid to visual sighting, a research program is presently underway to determine the applicability of this scheme to enhance the conspicuity of aircraft in flight, thus reducing the probability of collision. The results of this research will undoubtedly provide some guidance as to the feasibility of your proposal on this subject. From the above you can see that the Federal Aviation Agency is very much in the picture in the crash locating device area and intends to pursue it to a satisfactory conclusion. The support of organizations such as yours is necessary and highly appreciated by the Agency.

In compliance with the Administrator's request for coordination and assistance, and recognizing that the past year has been a year of reorganization and shakedown for the FAA, NASAO and its individual members have tried to be of maximum assistance to the Agency throughout this period. However, like the representatives of several other associations who have previously testified during these hearings, NASAO members are deeply concerned over the manner in which the FAA is presently conducting its rulemaking activities. I refer particularly to the increasing tendency on the part of the FAA officials to initiate rulemaking without giving industry and interested persons who would be primarily affected, an opportunity to present their views and recommendations during the period when studies and investigations are being, or should be conducted before actual rulemaking is formally initiated.

The administrative officers and staff of the FAA are in general technically well qualified and are dedicated public servants, but they do not have a monopoly on the brains in this country or in the aviation business, and we are of the opinion that interested and affected agencies, groups, and individuals should have more opportunity to present their views, recommendations, and advice, and detailed information which only they have, or may have cognizance of before the FAA decides formal rulemaking is necessary.

The procedure provided for by the Administrative Procedure Act for publicizing rulemaking is not entirely adequate or satisfactory in an industry that is as complex and that is changing, expanding and progressing as rapidly as is the aviation industry. It is strongly recommended that the FAA reestablish the Washington and regional staff, organization and procedure similar to that formerly followed in air coordinating committee airspace meetings whereby all interested persons can regularly assemble in informal meetings prior to initiation of formal rulemaking for the purpose of discussing with Federal officials, and with each other, the problem and for the submission of pertinent information that the Administrator should have before he reaches a decision. If this is done he will not be accused of following a policy which may be characterized with the expression "Don't confuse me with the facts, my mind is made up."

Thank you very much.

Senator MONRONEY. Thank you very much, Mr. McMullen. We appreciate your appearance here and the contribution that you are making in these various booklets and posters and in many other steps through your State associations to the cause of aviation safety.

We appreciate your remaining this long. We are glad to have your statement, as always.

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Our next witness and the last for today, is Mr. W. R. Laudenslager, eastern vice president, National Aviation Trade Association.

We are glad to have you here, Mr. Laudenslager, and happy to receive your statement.

STATEMENT OF W. R. LAUDENSLAGER, EASTERN VICE PRESIDENT; ACCOMPANIED BY BOB MONROE, EXECUTIVE DIRECTOR, NATIONAL AVIATION TRADES ASSOCIATION

Mr. LAUDENSLAGER. Thank you, Mr. Chairman.

I will try to make this as brief as possible in view of the lateness of the hour.

Senator MONRONEY. We are sorry that we have not been able to reach you earlier. But as you see the committee had to hear out the other witnesses.

Mr. LAUDENSLAGER. Thank you.

My name is W. R. Laudenslager. In my own right, I own and operate a business facility in Red Bank, N.J., which provides retail goods and services to general aviation. I am what has been known in the industry for many years as a "fixed-base operator," but I believe a more descriptive term would be an "aviation businessman." I have been in this civil aviation business continuously for over 30 years. At present, I am serving as eastern vice president of the National Aviation Trades Association, and appear here today in its behalf.

I would like to introduce at this time the gentleman on my right, Mr. Bob Monroe, who is the executive director of our organization. I am going to ask him to help out on any technical questions which might be asked later.

Senator MONRONEY. He succeeds our beloved friend and faithful attendant at all our hearings, Mr. Charles A. Parker, I believe, who passed away this fall.

Mr. LAUDENSLAGER. That is correct.

I am sure that our former director did a very good job and, as you say, you are very well acquainted with his previous testimony.

Senator MONRONEY. He certainly did, and he represented not only your association with great ability and care, but he also made great contributions in the field of aviation.

Mr. LAUDENSLAGER. Thank you.

I feel sure that Mr. Monroe will carry on the good cause for our organization.

NATA is composed of more than 450 aviation businessmen, like myself, who are engaged in providing retail goods and services to the general public. Our members own and operate private airports; provide air taxi services, train pilots and mechanics; provide maintenance, repair, and overhaul services for aircraft and equipment; sell aircraft and accessories; provide highly technical services for the maintenance, repair, and overhaul of specialized items of aircraft equipment and provide aerial applicating services to agriculture and forestry for the control of weeds and insects to increase farm productivity and make certain farming operations more efficient.

Through one service or another, NATA members serve the farmer, the rancher, the forester; the businessman making a trip to an out-of-the-way place or to an airline terminal; the customer who needs an aircraft of his own, the training to operate it, and the maintenance to keep it going; and in many places, we also provide the airport into and from which he can operate in the pursuit of his own affairs.

We estimate that aviation business does an annual gross volume greatly exceeding $1.5 billion per year.

The aircraft which our people sell vary in price range from approximately $5,000 to substantial six-digit figures per copy. In the new light aircraft field, that is, those weighing under 12,500 pounds, the average new airplane sells for well above $20,000, which would buy, even in these days, a rather nice home.

The services our industry has performed for agriculture and forestry have added greatly to the productivity of these resources and have conserved untold amounts from damage and destruction. Thus, due to our pivotable position on the general aviation scene, we feel that the opinions which emanate from our industry arise from solid, substantial people performing a vital function and merit serious consideration.

We well remember your promise given almost 2 years ago of vigilant legislative oversight on the functioning of the Federal Aviation Act and a swift redress of any deficiencies which the passage of time should demonstrate. We both compliment and thank you for the swift redemption at the first available opportunity of the first portion of this promise and look forward with confidence to the second.

The deliberate dispersion of power is an accepted and treasured principle of American Government. The tensions created by opposing forces protect the rights of the regulated. And history amply demonstrates a need for their protection.

In 1958, we feared, and subsequent events have justified that fear, the concentration of administrative, legislative and judicial power in a single agency headed by a single man. In the drive for quick and efficient airspace management, the system of checks and balances provided by the division of authority between the Civil Aeronautics Board and the Civil Aeronautics Administration was substantially eliminated.

We do not believe that it was originally your idea to do this, for in the draft of S. 3880 you provided in section 601 a right of suspension and review for any rule, regulation, or minimum standard issued by the Administrator when the Board found reasonable grounds to believe that their imposition would create a substantial economic hardship on persons affected without sufficient cause.

NATA asks that you amend section 601 of the present Federal Aviation Act by adding this paragraph, providing a right of suspension and review, which you originally proposed. We ask it for several reasons.

We do not believe that aviation is any less entitled to a system of checks and balances than any other portion of the American scene. Yet, we do not have them.

In its rulemaking processes, executed in the course of the past year, the Federal Aviation Agency has studiously avoided holding hearings where its proposals might be examined, its theories questioned, its

arguments rebutted and its justifications proven false. The Agency has instead claimed that hearings exist for the sole purpose of presenting new or not easily printed evidence to it.

The Agency apparently feels that it need not justify its actions to the public nor to the industry and, therefore, you gentlemen and your colleagues in Congress, are the sole group to whom it will respond to questioning.

In the matter of safety, the Civil Aeronautics Board advises us that they have no record of any accidents in which the pilot's physical condition was a causative factor. The Civil Aeronautics Board, in its testimony to you, has provided a great number of causative factors of accidents.

Yet, the rulemaking activity of the Agency has paid little heed to the historical causes of accidents and has instead concentrated its attention upon rulemaking to eliminate pilots for not meeting questionable medical standards, reaching an arbitrary chronological age or just making it too inconvenient for the private pilot to go get a medical examination. Thus, despite the fact that there is no statistical evidence to substantiate the need for such a development, the Agency's Civil Air Surgeon has apparently embarked upon an empire-building program to build medical centers, staffed with all the latest equipment and finest specialists to provide free examinations to rejected applicants and to establish inspection personnel to investigate the medical profession to see if they are qualified to give a physical examination which is simpler than an insurance examination.

Thus, the Agency pursues research, rulemaking, and empire-building programs for purposes insignificant to the cause of accidents, while major action on the cause of accidents goes wanting.

Some idea of the magnitude of this empire building can be obtained from a comparison—approximately 140,000 civil and military aircraft exist in this country. We have a Federal Aviation Agency which presently employs approximately 35,000 people.

The Federal Highway Administrator estimates that motor vehicle registrations for 1959 will approximate 70,416,000. If we had a Federal Automobile Agency on a comparable basis, it would employ approximately 17,600,000 persons.

If aviation, and more particularly general aviation, is to develop in the fashion in which we all hope and think it will, our present proportions of regulatory personnel in relation to aircraft numbers must decline abruptly.

We have one Federal civil servant for every three civilian aircraft in existence and no one knows how many for each aircraft which may be in the air at any given instant. We do not believe the American people know this or will long tolerate it when they find it out.

One of the major problems in General Aviation is the dissemination of weather information—and accidents caused by weather rank high among the causes. Why is it then that the scheduled weather broadcast still enjoys so low a priority that practically everything else on the communicator's list of duties must be performed before he is authorized to give the scheduled weather broadcast at 15 and 45 minutes after the hour? Changing this priority and making dissemination of the weather at the scheduled time would not even cost money.

Little progress has been made in establishing the continuous weather broadcasts throughout the country on the "sacred 88" low frequency stations which were preserved for this purpose.

Due to the great numbers of general aviation aircraft which operate under VFR conditions, we have sought an expansion of the uncontrolled airspace which is available to these people. After much difficulty, negotiation and compromise, an agreement was reached with the Civil Aeronautics Board 2 years ago that by January of this year, the floor of the airways should be raised to 1,500 feet from its previous 700 feet.

With a year in which to act, the Federal Aviation Agency has advised us that sufficient time did not remain and this would have to be postponed for another 6 months.

One of the reasons given by the Agency for its inability to provide for a lifting of the floor of the airways at the time provided was that it did not know how much was involved in making this change. This despite the fact that it had drawn from the Civil Aeronautics Board people who had been involved in the formulation of this particular rule.

It appears to us that if the right of freedom of transit of the airspace is to be guaranteed to all, that adequate uncontrolled airspace for the movement of general aviation aircraft must be provided for maximum safety.

The Federal Aviation Act presently gives the Administrator a carte blanche to organize his agency in any way he sees fit. In terms of efficiency, this is probably a good thing. But in terms of protection of the rights of the individual, who in mass composes the public, it leaves something to be desired. It is our feeling that the act should be so amended that there would be effective separation of the legislative and quasi-judicial functions of this Agency from the administrative functions.

As it is at the present moment, rulemaking functions are distributed throughout the various bureaus of the agency. If adequate checks are to be provided, then the legislative rulemaking function should be established as a completely separate bureau and not integrated with other administrative functions.

We believe that when the Congress provided an appeal on airmen certificates to the Civil Aeronautics Board, it did not contemplate that the Agency would so change the rules as to effectively wipe out the value of any appeal. Nevertheless, this is what has occurred and is another reason why we believe that the right of appeal to the Board on rules should be reestablished as originally proposed by your committee 2 years ago.

During the past year, we have seen little evidence that the Agency is responding to repeated requests for safety measures obtainable with relative simplicity on airports. We have long sponsored a proposal for the provision of small runways on major terminal airports so that light and heavy aircraft traffic could be separated for landing, take-off and pattern purposes. The hazards to light aircraft of operating in the wake of heavy aircraft is well known and demonstrated.

Yet only recently the Agency has proposed traffic pattern rules for the Los Angeles area which call for all airplanes to operate at 1,500 feet, regardless of size. Since light aircraft have not been a major

factor in the noise problem around terminal areas heretofore, it is reasonable to assume that this situation has not changed and these aircraft could still continue to operate at altitudes of 800 to 1,000 feet above the ground and the larger and heavier aircraft have their own traffic pattern 500 feet higher where they would not create a hazard to light aircraft in flight in the traffic pattern.

As far as we can determine, the Agency refuses to consider the case for the lightly constructed short runway for VFR general aviation aircraft use.

In our opinion, there is a very valid case for the light aircraft parallel runway concept under VFR conditions to serve the needs of the public at the time when the greatest traffic occurs.

Examples that this system works abound. Phoenix, Ariz., presently stands No. 3 in the number of aircraft movements per year and uses this system which divides traffic so that general aviation and air carrier aircraft up to and including DC–3 type equipment use one runway and traffic pattern, and heavy aircraft and Air National Guard use another simultaneously.

You gentlemen are well aware of the difficulties of writing perfect legislation and understand, perhaps as few others can, the necessity for the exercise of judgment and discretion in the administration of rules.

It appears to us that the Federal Aviation Agency has embarked upon a program of administering its rules to the letter and withdrawing from its aviation safety agents in the various districts the exercise of commonsense, discretion and good judgment which they formerly employed.

Thus we find a substantial increase in the number of technical violations which have little effect upon safety and, as a consequence, have been ignored as a result of experience and knowledge of when and where they should be applied.

Thus, recently an operator had a violation filed upon him for flying a Tri-Pacer with the door removed so that he could take aerial photographs, because he did not have a supplemental type certificate for operation of the aircraft with the door removed.

The fact that this type of flight and this type of operation had been done many times before throughout the country without accident was immaterial. It was a violation of the rule. It is our view that some tightening of enforcement was due and it was welcomed by most of the industry, but we do think that commonsense and good judgment should prevail in determining which items are significant and should be enforced, and which items are insignificant and may be ignored as they have been in the past, until the language can be corrected.

Almost 2 years ago, the Civil Aeronautics Board proposed a requirement for some instrument competence to be demonstrated by students seeking a certificate. NATA favored and supported such a requirement and besought the Board to put it into effect. This proposal was transferred to the Agency and it was only after consistent and repeated representations that the Agency was persuaded to adopt this proposal in a modified form last November to become effective this March. We are unable to understand why the Agency was unable to put it into effect much, much earlier.

In a similar vein, in the field of aerial application, we have long recognized the serious problem which we face in aerial application accidents. And for the purpose of helping to remedy this problem, we presented to the Board a proposal for the creation of an aerial applicator air agency imposing standards sufficient in our view to make a major contribution towards the improvement of the safety record of aerial applicators. This, too, was transferred to the Federal Aviation Agency and rested on the shelf until the Agency was advised by a Representative in the other chamber, that the Agency should do something in respect to the protection of persons and property on the ground from the hazards of aerial application.

It is our impression that this proposal enjoys a relatively low priority among the Agency's present efforts. We believe that this is a matter of considerable interest to the general public as well as ourselves. We should like to see consistent work undertaken to complete its formulation, with the help and counsel of the industry which it would regulate, and implementation.

In all this, we have made no comment concerning the Administrator. In our opinion, the Administrator operates under a law which is interpreted for him by his legal counsel. If this interpreation goes wide of the intent of Congress when it passed the legislation, as we think it does, then there is little point or justice in belaboring the Administrator.

In our opinion, the cure is not necessarily a change of Administrators, though it might indicate a desirable change in legal interpreters. *Rather, we think that the act itself should be amended to provide a* clear-cut review and appeal by the Civil Aeronautics Board in section 601, as we have proposed above.

In addition, we believe that section 302 should be amended to provide that the legislative rulemaking functions of the Administrator shall be vested in a separate bureau.

We also believe that section 301a must be amended in such fashion *that the Administrator cannot possibly adopt the position that he* cannot, need not and should not listen to or receive advice before *making decisions.*

The air coordinating committee had its faults. But we regret to say that so far as we are concerned, it provided a better vehicle for the understanding and resolution of differences concerning the use of the airspace than that which the Agency now employs. We, together with other general aviation organizations, have gone to great lengths to show the Administrator how he may, without abrogating his rights and duties in any particular, avail himself of our knowledge and information and likewise to eliminate conflicts where none need occur and increase understanding of users of the airspace where restrictions or limitations are necessary.

Finally, we believe that section 901 should be amended by putting limitations upon the techniques or methods through which the Administrator imposes fines or compromises civil penalties or by removing the authority of the Administrator to compromise civil penalties under title 6 and giving it to the Civil Aeronautics Board.

This concludes our testimony on the general aspects of the administration of the Federal Aviation Act and safety. We will present

additional testimony on the subjects of airspace management and pilot qualifications and certifications.

Again, Mr. Chairman, we thank you for this opportunity to present the views of general aviation business on these matters which are so important to us and to our customers.

Senator MONRONEY. Thank you, Mr. Laudenslager. We appreciate your statement.

One thing that it is difficult for me to understand, which was mentioned by you and Mr. Hartranft, is that of the large number of people employed, approximately 35,000. Then you expect greater services from the Agency. It has been pointed out over half of these people are in air traffic control. These boys in the air control towers are probably the best friends the pilots have. To my knowledge, I don't think they are underworked. Would you say that we should lay off some of these boys who give directions in the air traffic control towers?

Mr. LAUDENSLAGER. I wouldn't say in that division that those boys should be laid off. We feel, however, that the help in the field is being improperly used; that they are going backward rather than forward. I am thinking more in terms of general inspection, flight testing, and so forth.

Fifteen years ago we had a system whereby the CAA did all the flight testing of students for licenses and it got out of hand. They didn't have enough personnel. So they set up this program for flight examiners. It had its weaknesses. But by and large the industry did a job in handling their own ranks.

Now the FAA is rescinding that program, backing it off to where I would say 98 percent of all the flight examiners have been eliminated, thereby throwing the load back on to the agency employees, which I think is going in the wrong direction.

Senator MONRONEY. But you would not cut down on any of the air traffic controllers; you would rather increase them, I presume. Like most pilots they would like more control tower operations rather than fewer.

Mr. LAUDENSLAGER. Yes. I would say that they would have to be increased. It is in the other lines where I think they have possibly more help than they need.

Senator MONRONEY. You mentioned the need for better weather service. I certainly concur. Yet, that will take more people if we are to implement and to serve better with the weather facilities available to the private pilots.

Mr. LAUDENSLAGER. As I pointed out, there are a lot of improvements that could be made without costing any money. For example, the dissemination of information today has the lowest priority. Everything else comes first. I think they could very easily turn that around and have that mandatory that that go out on the scheduled reporting times, regardless.

Senator MONRONEY. On the regulations, other regulations that you prescribe, each one of them in here will require more personnel. It is a question of where you put it, as I understand, which is the burden of your complaint. But I find it difficult to relate your testimony and that of the last witness to automobile traffic. A man can sometimes run a stop sign and sometimes run a red light, or maybe "fudge"

on the center side of the road or speed a little too much, and he may not be endangering human life as much as if a pilot over an airport or on an airway would if he deviated from his assigned altitude. I think you are comparing two things that are not related particularly to the highway registrations and to the number of people involved in the enforcement.

Mr. LAUDENSLAGER. I would like to have Mr. Monroe comment on that, because he has worked with that particular idea much more than I have in the field.

Mr. MONROE. Senator, our thought here is primarily that if we keep on developing a ratio of employees to number of aircraft, as we have, this will get to a point where we will have to back up and go in the other direction.

Reference has been made previously during the day to the yoeman work done by the RTCA in establishing our common control system. There are some of us who wonder if this was a proper determination, because if we are to continue to expand the numbers of aircraft we have, and have to continue to expand the facilities we have, it is going to take a really fantastic set of traffic control systems to handle it.

What we need is a higher priority in the research and development program for this collision avoidance equipment, and for some kind of aircraft—that is, a navigational system which is carried by the aircraft, which is capable of being used by all aircraft and does not require ground assistance. Eventually, if we get millions of aircraft, then we are going to need something that will enable these people to handle themselves, rather than having to run it through a control system.

Senator MONRONEY. That, of course, is a problem. I am sure that we are employing a great many people in research and development, and that it is running into a rather fantastic figure. I have been alarmed at it, but I have been told it is necessary. Here again, to get the things that you want to automate, the airways will take a lot of people to try to discover them. To my knowledge we have not yet come very close to all the research that has been done, not only by Government, but by a number of individual electronic companies to find something that would be more helpful than hurtful in collision detection devices.

Mr. MONROE. Senator, may I suggest here that one of the burdens of what we have said here is that if the personnel, which they presently have employed and working on things like safety rulemaking, will address themselves to the historical, statistical causes of accidents, instead of to things which do not cause accidents—or at least we do not have any record of—we will be advantaged.

Senator MONRONEY. Of course we are working all the time on that. We have addressed ourselves to the major causes of accidents, to the increasing number of collisions, and apparently we have been relatively successful in putting the military and civilian under a common system of air navigation which was a major step. There have been many other major steps. The thing that worries me about the testimony is that we can only see the pimples on the face of this new baby and we haven't yet found out how robust it has become to move in and to try to integrate 50 percent of the traffic that was flying under one set of rules and 50 percent under another, using the same airspace. The

number of things that have been done, I think, in a year would probably mark a rather great achievement for any new agency; to assimilate the various other agencies that were merged with it; to straighten out is procedural organizatios; to get itself, you might say, airborne and ready for flight. I don't think it is probably trimmed out yet. I do feel that they are moving along at a pretty good rate. I assure you it is no fun to conduct these hearings at the opening of the session, to try to bring out the legitimate and cogent and well thought-out suggestions for improving air safety and for taking up these other matters as we come to them.

Certainly, I think we should consider the good along with the bad. And we should not attribute evil motives to anybody, in spite of maybe hot tempers—and I compliment you on the temperate statement that you have made in your consideration for the problem of the Administrator. I think certainly we should not condemn the product on the basis of its first relatively small period of performance. The things that need to be corrected, I am sure will be done through consultation, committee reports, or, if necessary, some legislation.

We appreciate your being here. If you have anything to add, we will be glad to hear it.

Mr. LAUDENSLAGER. I have ony one point that I would like to make a little plainer, possibly, and that is that we have a great fear of this taking on the aspect of a dictatorship. We have certain things that have proved over a period of years to be doing a good job, and then, with no hearing, no chance for industry to sit down and talk it over, they start, for example, rescinding the flight examiners, which put a terrific load on a fixed base operator where all your good flying schools had a flight examiner, and getting a student ready for a private or commercial license, whatever it was, and you were able to carry it through and get him his ticket without any undue hardship on the student or on the company itself.

They have come along, and of course they had the right to come in and flight check these, spot check them, to be sure they were holding up to the standards. Now they come along and take them all the way any say you boys can't do it now.

The fact that we did it all through the training in the war period and afterward, now we can't do it. They are going to do it with their own FAA men. They haven't the men to do the job that needs to be done, without putting this extra load on them. Which means it has all the aspects of them wanting to run the entire show without any help from the outside.

To me that is a bad sign. That is one angle in particular that affects the fixed base operator.

Senator MONRONEY. Are the check pilots who have been doing this work members of your association?

Mr. LAUDENSLAGER. That's right, the majority of them are.

Senator MONRONEY. But they are also qualified instructors, so they could continue to instruct? They are not unemployed; is that correct?

Mr. LAUDENSLAGER. That's right.

Mr. MONROE. Could I clarify? These people are generally employees of our members. They are not necessarily members.

Senator MONRONEY. But they are a part of the people employed by your organization?

Mr. LAUDENSLAGER. That is correct.

Senator MONRONEY. Have you observed any arbitrary qualifications that they have insisted on in the proficiency of the students?

Mr. LAUDENSLAGER. No; I wouldn't say that. Occasionally the CAA, and now the FAA, would spot check a recent graduate. We, at least in our operation, never had any trouble. Personally, I thought the program was working pretty good. Wherever you give anybody a little power, there is always somebody who will abuse it. That is true. But I don't think that, by and large, was any great point. This rescinding of these appointments, arbitrarily, to me is a very serious item. It can only be that they are going to control and handle everything, and they don't even give you a chance to say, "You are not doing the job, here is why, so we are going to take it away from you." If this continues on in other lines, like this living right to the letter of the law, like the case we cited about a man who took the door off to take photographs, this has been going on ever since they had airplanes that had a door that you could take off to take pictures. Now they come along and say it can't be done. Still industry has in the past been able to decide what airplanes could be flown with the door off and what might be dangerous to take the door off.

They don't seem to figure that we have any commonsense any more. It looks bad.

Senator MONRONEY. Do you have any further comments?

Mr. MONROE. No, sir.

Senator MONRONEY. Thank you very much for your testimony. The committee will stand in recess until 10 o'clock Tuesday morning.

(Thereupon at 6:06 p.m., the subcommittee hearing was recessed, to reconvene at 10 a.m., Tuesday, January 19, 1960.)

REVIEW OF THE FEDERAL AVIATION ACT

(Air Safety)

TUESDAY, JANUARY 19, 1960

U.S. SENATE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
SUBCOMMITTEE ON AVIATION,
Washington, D.C.

The subcommittee was called to order at 10:20 a.m., in room 5110, New Senate Office Building, Hon. A. S. Mike Monroney presiding.

The Subcommittee on Aviation will resume its hearings.

As everyone in the room probably knows, there was another very serious wreck on Capital Airlines, flight 20, last night. I would like to read the preliminary report of the CAB for the information of the subcommittee, and those in attendance. It reads as follows:

Capital Airlines Viscount, operating as flight 20, departed Washington at 2140 eastern standard time, January 18, 1960, en route to Norfolk, Va., crashed and burned near Holcroft, Va., 20 miles southeast of Richmond, at approximately 2248. On board were a crew of four, Capt. James B. Fornasero, First Officer P. H. Cullon, Stewardesses B. O'Donnell and B. Jordt, and 46 passengers, including 2 infants, all reported fatal.

The last radio contact with the flight was at 2201 over Tappahannock, IFR at 8,000 feet, at which time position report was given, estimating Norfolk at 2232. At 2245 people in the vicinity of Charles City reported hearing the sound of engines being revved up and shortly thereafter a crash.

Security was established by State police who reported the aircraft was destroyed by fire.

Weather at Norfolk at 2200 eastern standard time, January 18, 1960, was reported as follows: "Special No. 12; scattered clouds at 700 feet, broken clouds at an estimated 6,000 feet; visibility 6 miles in fog; temperature 53; dewpoint 53; wind south-southwest at 8 knots; altimeter 29.58."

Oscar Bakke, Director, Bureau of Safety, and E. C. Hodson, Assistant Chief, Operations Division, departed Washington by car immediately upon receiving word of the accident. Personnel from the Board's New York and Washington offices are en route to the scene.

This is all we have at the moment on this latest accident.

We are honored today to have Mr. Clarence N. Sayen, president, Air Line Pilots Association; who has been very helpful to this committee in the past and one of the pioneers in the effort to establish an independent Federal Aviation Agency.

We are happy to have you, Mr. Sayan. I note you are accompanied by a group of your senior pilots who are here to assist in any specialized testimony that may be required.

We have a statement from you. I would suggest that since it is long, that you give it for the record, and then we will question you after you have completed.

You may proceed.

STATEMENT OF CLARENCE N. SAYEN, PRESIDENT, AIR LINE PILOTS ASSOCIATION; ACCOMPANIED BY CAPT. J. D. SMITH, CAPITAL AIRLINES; CAPT. C. C. SPENCER, PAN AMERICAN WORLD AIRWAYS; CAPT. R. J. ROHAN, NATIONAL AIRLINES; CAPT. W. MASLAND, PAN AMERICAN WORLD AIRWAYS; CAPT. C. E. LUTHER, CAPITAL AIRLINES; CAPT. S. W. HOPKINS, DELTA AIRLINES; CAPT. ALLEN ADAMS, BRANIFF AIRLINES; CAPT. H. B. ANDERS, UNITED AIRLINES; CAPT. ROBERT L. TUXBURY, UNITED AIRLINES; THEODORE LINNERT, HEAD OF THE AIR ASSOCIATION'S AIR SAFETY ENGINEERING DEPARTMENT; AND CAPT. EDWARD A. TAPPE, CAPITAL AIRLINES

Mr. SAYEN. Thank you, Mr. Chairman.

It is an honor to have this opportunity to appear again before the Aviation Subcommittee who have contributed so much to aviation in this country.

Because of the wide range of subjects that we would like to discuss with the committee, I have brought with me a number of our pilot representatives who have specialized in various fields of air safety representation for the association over the years; and if it is all right I would like to introduce some of these people to the committee and say just a few words about their backgrounds, so it might be helpful to the committee later in any questions they may have concerning our statement.

On my far right is Captain Smith, who flies for Capital Airlines, attended St. John's University, and started flying in 1940; has about 16,000 flying hours, and has represented the association for the last 8 or 10 years in matters primarily concerned with air traffic control.

Next is Captain Spencer, of Pan American World Airways, the vice president of the association. He started flying in 1926 and has made his living as a pilot since 1930; has been an airline pilot since 1936. He flies practically all of the world routes of Pan American, apparently primarily in the North Atlantic, Europe, the Near East, Africa, and South American areas. He has about 20,000 flying hours.

Next is Capt. R. J. Rohan, National Airlines. He has been with National Airlines since 1940, a pilot in the 8th Air Force, a B–17 commander during the war, and approximately 11,000 flying hours, and has been a vice president of the association and has represented the association in many activities over the years.

On my right, Captain Masland, Pan American World Airways, a graduate of Haverford College, in physics. He soloed in 1928, Pensacola in 1930 and 1931, and has been with Pan American since 1935 over practically all of the routes of Pan American throughout the world, currently in the North Atlantic and European areas. He has been a vice president of ALPA, regional vice president of the International Federation of Air Line Pilots Associations, and has represented the association for the past 3 or 4 years on the jet operational requirements of ICAO, which has been doing planning for jet operations.

On my far left is Captain Luther, Capital Airlines, vice president of the association, flying since 1943. He was with the Air Corps

during the war. He has been with Capital since 1948, and is a regional vice president of the association. He has been active in all representation work with the association.

Next is Captain Hopkins, currently with Delta Airlines, engineering graduate of the University of Southern California, who entered the Navy in 1930. He has been in airline flying since 1933. He is presently the senior active pilot with Delta Airlines. He is a captain in the Naval Reserve. He has about 25,000 hours of flight experience. He is currently flying DC–8's for Delta Airlines. He is the first vice president of the association.

Next is Capt. Allen Adams, a graduate of St. Joseph Junior College, with the Air Corps since 1941, presently flying with Braniff Airways, formerly with Midcontinent Airlines. He is a graduate of the Kansas City Law School, and is still active in the Air Force Reserve, and a vice president of the association.

Next, Capt. H. B. Anders, United Airlines. He has been with United since 1940, a graduate of Ohio University in engineering, has about 16,000 flying hours, and is regional vice president of the Air Line Pilots Association.

Next is Capt. Bob Tuxbury, a graduate of the University of New Hampshire, a graduate of Pensacola Flying School; has been with United Airlines since 1939. He is currently qualified on DC–8 aircraft. He served in various safety functions for the association for many years and is currently secretary of the association and has about 17,000 hours of flying time.

On my immediate left is Ted Linnert, who is head of the association's air safety engineering department, ALPA, and has been for the past 16 years.

Immediately to my rear is Captain Tappe, of Capital Airlines, a graduate of Duquesne University, University of Kansas Law School. He has been an airline pilot since 1934. He is presently chairman of the dangerous cargo committee of the association.

Senator MONRONEY. Thank you, very much, Mr. Sayen, for bringing these senior pilots here and to have them participate in these hearings. We find that their long experience is probably one of the finest things that this committee has to rely on in matters of air safety needs and procedures and things of that kind.

Before we start, do you have any information whatever that would be helpful in connection with the primary news of the accident last night?

Mr. SAYEN. Mr. Chairman, we have just talked to the people at the accident scene, but I don't believe we are in a position to add very much to your introductory statement at this time.

Senator MONRONEY. Is it not a fact that any time an accident occurs, your experienced pilots do come in to assist the CAB in ascertaining the cause, because no one is more vitally concerned in air safety, than the men who are members of your organization.

Mr. SAYEN. Yes. Our accident representatives left here about an hour after the crash last night and have been at the scene since. We will have a crew following through on the entire accident investigation.

Mr. Chairman, I brought a number of pilot representatives here, as I said, because of the wide range of subjects you want to discuss. Also, among this group I believe you will find pilots currently operat-

ing practically all of the transport aircraft being operated by the air carriers of this country, all the way from the DC–3 through three of our people here operating 707's in the North Atlantic, in the case of Captain Masland, DC–8's, and in the case of Captain Tuxbury.

In my statement I have an outline of the hearings set up by the committee. They are broken down into five separate parts.

We have had a very, very heavy schedule and consequently my statement will deal with more than one of the subjects, but not in great detail. We will be very happy to return later to give further detail on some of the other subjects.

Senator MONRONEY. Thank you.

Mr. SAYEN. My name is Clarence N. Sayen. I am president of the Air Line Pilots Association, International, and the International Federation of Air Line Pilots Associations. A brief description of these organizations and my background is attached to this statement.

We are pleased to have this opportunity to discuss these very important subjects with you. We feel that substantial contributions to aviation safety can result from congressional interest in some of our current problems in the aviation industry.

ALPA'S ORGANIZATION FOR SAFETY

Before beginning this discussion, I believe that a few words about the competence of this organization and its members to make these comments and the organizational structure throughout which safety problems are processed would be helpful. This association currently represents the pilots of 49 airlines through 149 councils located throughout the United States, its territories, and a number of foreign countries. Each council has an air safety committee composed of active airline pilots who are selected for their competence and interest in the air safety problems being encountered by their pilots. The chairmen of all of the council air safety committees are organized into a central air safety committee which coordinates the safety activities of all of the pilots of the particular airline, subject to the authority of the master executive council which is their highest governing body and which is subject only to the board of directors which makes national policy for all pilot groups within the association. In addition to the airline by airline pilot safety organization within ALPA, regional safety chairmen are appointed within five main geographic regions and within subregions. These pilots coordinate the safety activities which are primarily regional in character. Each pilot group designates accident investigation representatives who, along with regional representatives, participate in the investigation of all major air carrier accidents and report their findings to the president of the association. The activities of all of these safety representatives are coordinated by the international officers of the association and by a professional staff. When specific problems require sustained study and representation, committees are created of pilots specializing in the particular subject and assisted by professional staff. For example such committees in recent years have reported on such problems as new aircraft evaluation—we evaluate new transport aircraft—training standards, collision avoidance, dangerous cargo, air traffic control, physical standards, and others. The average pilot appointed as a

safety representative will be, in addition to his academic training and pilot training, an airline pilot of long experience. He will be working as a safety representative in a field where he is personally concerned with his own survival and economic security. His daily work routine requires monitoring of the aircraft, aviation facilities, and procedures upon which he depends. He must, by training and experience, be very critical of inadequacies and be able to do something about them. While many of the pilots are trained, experienced, and some are currently active in military operations, they are now specialists in civil aviation which presents substantially different problems.

In international aviation, ALPA has affiliated with the pilot organizations of 33 other countries whose members perform practically all commercial flying outside the Iron Curtain countries. The secretariat and staff of the federation are maintained in London. The federation provides a means of processing technical and safety problems of an international nature in aviation by the coordination of pilot efforts and through international agencies. The air safety organizations of ALPA and IFALPA make available a means of monitoring the aviation facilities, equipment and procedures throughout the world 24 hours a day each day of the year and processing the problems which are detected.

Before begining our discussion of problem areas, we want to put our remarks in perspective. Air transportation is a safe means of travel and we have great confidence in its ability to provide even safer, more comfortable, and a more efficient travel in the future. We want to emphasize that. In pointing out problem areas we are not trying to scare passengers off the airplanes. *It is a good, safe way to travel.* However, it is a potentially hazardous business in which the highest degree of care must be maintained in order to keep it safe and efficient. It is an industry of constant technological change which, therefore, requires continuous planning and reevaluation. No purpose however would be served by our coming before you to tell you how good we are. We are here to criticize, to point out areas of weakness and poor performance, and, hopefully, to stimulate action and planning for the future. This has been our role for almost 30 years and we intend to continue it. One of the primary responsibilities of the pilot and his organization is to constantly monitor aviation facilities and programs and to point out areas of hazard and inefficiency as we see them.

Some people seem to think this is wrong and that criticism and controversy should be avoided, particularly when it is aimed at them. They say that those who criticize are "pressure groups." We do not agree. Criticism and controversy are very basic foundations of our system of life and government and without them very few basic decisions would be made and much progress would be delayed.

We would like to point out, for example, that we were roundly condemned by public officials, certain segments of the press, and others, when we were critical and insisted that the following items be added or changes be made over the years:

(1) Full feathering propellers—20 years ago.
(2) Reversible propellers.
(3) Approach lights.

(4) Improvements in air traffic control in the early 1950's. (We were told that we were alarmists and that the system was fine.)
(5) Temperature accountability.
(6) The removal of CAA from the Department of Commerce.
(7) Standardization of the location of basic flight instruments.
(8) FAA approval of training programs.
(9) Airborne radar.
(10) Increased requirements for copilots;
and many others.

Our statement, therefore, will be critical and will point out deficiencies and hazards. This does not mean that it is not meant to be constructive or that we feel air transportation is not a safe, comfortable way to travel. We merely want to keep it that way, and to accomplish this we have found we must be aggressively critical and occasionally hurt someone's feelings. We would like now to briefly review our view of the safety record during 1959.

THE SAFETY RECORD DURING 1959

The committee has available to it the statistical record on air safety during 1959. We will merely summarize our view of it briefly.

The record for 1959 is not good. The association's records show that during the calendar year 1959, 16 fatal accidents involving U.S. carriers occurred in which 271 passengers and 60 crew members were killed. (These figures are taken from ALPA's files and are tabulated in attachment A.) These accidents may be categorized as follows: Seven on approach to airport; eight en route—mechanical, weather, flight controls, fire, and so forth—and one during takeoff—engine failure.

Of these 16 fatal accidents, 10 involved trunk carriers, 3 involved local service carriers, 2 involved certificated cargo carriers, and 1 territorial carrier.

While 1959 was the first year of operation of straight jet aircraft and there were a number of near accidents, no major accident occurred in passenger service. There were, however, two major training accidents in who two aircraft were destroyed and nine crew members were killed.

Three major accidents in passenger service involved turbine-powered, propeller-driven aircraft. Two involved the Electra, which was introduced into service in 1959, and one involved the Viscount. There were no fatal accidents involving the turboprop FO–27 which was introduced into service in considerable numbers in 1959.

While there is no single cause or trend to which these fatal accidents may be attributed, they may be grouped roughly into two major categories: (1) those occurring during the approach to an airport and, (2) those occurring due to the disintegration of the aircraft in flight. One occurred during takeoff due to engine failure.

In addition to the foregoing, there were a number of very serious accidents which, fortunately, did not result in fatalities. Our records show at least 23 more serious accidents that had fatal potential. Of these the association records reveal that all but three were associated with the approach or landing. Of the remaining three, two involved fire in flight and one a control problem.

Any review of an accident record must have a primary purpose—to determine whether there are dangerous areas of deficiency which require remedial action in order to prevent similar accidents in the future. We believe that there is much to be learned from the record of the past year and the following discussion will cover areas in which we feel considerable improvement in aviation safety is possible. Many of these areas are familiar and will be recognized as problems with which the pilots have been concerned for a number of years.

THE INADEQUACY OF TERMINAL AREA FACILITIES

Previous sessions of Congress have been greatly concerned with the air traffic separation system provided by the Federal Government and the accidents and near accidents which were stemming from its inadequacies. This was one of the important problems which motivated Congress to enact the Federal Aviation Act of 1958. Whenever this matter has been discussed, we have attempted to point out that a safe and efficient air traffic system must encompass more than the airspace from airport to airport but must, in fact, stretch from the ramp of the departure airport to the ramp of the destination airport. There is not much logic in building an efficient air traffic separation system between two airports and leaving a bottleneck at both ends.

We believe that one of the most critical problem areas in aviation today is the inadequacy of the terminal area facilities. By terminal area facilities, we mean the navigation, communication, traffic separation, visual aid, and airport facilities by which the pilot takes his aircraft from the en route system, makes an approach to the airport, lands, and guides his aircraft safely to the ramp. These facilities have lagged badly behind the development of the aircraft and the growth of air traffic and the accident record for 1959 and previous years bears this out. An examination of the major and minor accident record for prior years will also reveal the large number of accidents occurring in the terminal area with approach and landing accidents predominating.

The association's records of serious fatal and nonfatal air carrier accidents—domestic and international—during 1959 indicate that of 39 accidents, 14 occurred during the approach or landing—terminal area. This accounted for 36 percent of the 1959 air carrier accidents and 37 percent of the total 1959 fatalities. From our analysis these accidents resulted, in whole or part, from a lack of landing aids and airport safety.

In our opinion, no single category of preventable accidents has caused so much loss of life, injury, delay and substandard air service, destroyed and damaged aircraft, and adversely affected the growth of the aviation industry than the continued lack of known and obtainable landing aids and airport safety standards.

This is a difficult area in which to secure improvement since there is usually overlapping jurisdiction between the Federal Government and municipalities. We believe, however, that it is a fundamental responsibility of the Federal Government to provide the air traffic system of the country and any air traffic system can only be as safe and efficient as the capability of the airport and terminal area permits. The Federal Government must, therefore, provide leadership, prescribe standards, and make available funds for this purpose.

For many years and currently, modern instrument approach facilities have been installed on only one runway in one direction at a few airports. We now have 569 airline airports in the United States and U.S. carriers operate into 157 foreign airports. We do not have at hand the exact figures for installed facilities but FAA planning figures indicated for the fiscal year 1959 that there would be 210 air traffic control tower services, 75 airport surveillance radar, 122 secondary radar, 65 long-range radar, 30 radar centers, 185 instrument landing systems, 53 approach light systems of various kinds, and 23 sequenced flashing light systems. The FAA has indicated that, for planning purposes, we can expect only 235 instrument landing systems installed by 1963, 100 radar surveillance plus beacon systems, and 30 ground radars for taxiing.

Senator MONRONEY. The 235 is the total that we would have in operation by 1963? It is not in addition to the present 185?

Mr. SAYEN. No, sir. It would be the total in operation by 1963, which a little arithmetic will show that we will have 330 airports and will not have the instrument landing systems that are being utilized by the airlines, and that on main airports, of course, we will have 1 system in 1 direction only.

As the foregoing figures indicate, there are a large number of our airline airports that do not now have modern approach facilities and cannot expect to have them by 1963. As a result, airline operations at many airports and many runways must be conducted with obsolete terminal area navigational and approach facilities, without approach lighting, adequate runway lighting, and other necessary facilities.

With modern aircraft requiring longer runways, many of our airports have become, for all practical purposes, single runway airports. Even our best equipped airports usually only have straight in, full instrument approach capability in one direction on one runway.

One of the most critical operating conditions which faces the airline pilot is the circling approach under low ceiling and visibility conditions. With smaller aircraft, this procedure is undesirable but has some measure of practicality. However, with larger, high-speed aircraft this maneuver is extremely marginal during normal operation and critical during an emergency. Without modern approach and landing aids at airports and in more than one direction, operations must be conducted with what is available.

Some low density traffic airports into which the Civil Aeronautics Board has certificated airline service have virtually no terminal area navigation, communication, or landing aid facilities owned or operated by the Government, or operated by the Government, or, for that matter, by anyone else. Some have radio beacons installed by the airline. Some have low-frequency ranges and VOR facilities without any additional approach aids such as the instrument landing system, approach lights, runway lighting, and so forth.

Fortunately, most of the research and development needed to provide the necessary terminal area facilities has been completed and the equipment is available for purchase. While the Administrator has initiated certain research programs in this area, we believe that most of the necessary information is available on which to base any remaining decisions and that no further delay should be countenanced because of lack of decision by the Government agencies concerned.

The runways on many of our airports are too short for the jet aircraft. Operations may only be conducted by substantial operating compromises both in runway selection with regard to weight, wind direction, runway condition, and so forth, and with regard to flight planning because of restrictions as to fuel weight which may be carried. Under any runway condition, except that of smooth, dry runways, the performance standards established for the aircraft make the operation marginal. Runway length requirements often leave the pilot with a single runway around which to plan his flight regardless of weather and runway conditions. The same situation applies at other airports for aircraft other than jets.

NOISE PROBLEM THREATENS TO COMPROMISE AIRPORT USE

Another serious problem threatens to compromise the safe and efficient use of commercial airports through the adoption of operating restrictions designed to minimize the noise nuisance for airport neighbors. In making this statement, we want it clearly understood that the airline pilots are sympathetic to the legitimate noise complaints of the airport neighbor and have cooperated and will continue to cooperate in any rational program designed to minimize the noise nuisance that is not an unreasonable compromise with safe operation. However, transport aircraft today are operated under a rigid set of airplane performance requirements which permit little deviation without compromising the safety of the operation. Noise regulations which represent a further compromise with present minimum standards for safety will not help the airport neighbor, the traveling public, or the aviation industry. Noise restrictions which restrict the right of the pilot to exercise his best judgment in the interest of safe operation and noise alleviation are not practical.

We believe that the Federal Government possesses the exclusive right to regulate interstate air commerce including the adoption of any regulations establishing methods of alleviating the noise problem. However, we feel strongly that any regulation adopted for the purpose of noise alleviation must be completely consistent with safe standards of operation and should not represent a further compromise of minimum standards of safety. Any such compromise will result in further deterioration of the utility of our airports and may be the cause of serious accidents in the terminal area. Most certainly any such regulations adopted must first be predicated upon a national standard establishing minimum safety standards which may not be compromised.

Operational regulations may only move the noise laterally or vertically and the eventual solution to the noise problem must come from adequate zoning of the approach and departure zones from airports and a further reduction of noise at the source.

AIRPORT ZONING

In 1952 following a series of disastrous air crashes in the vicinity of airports and continued public complaints over aircraft noise, President Truman created a Commission consisting of J. H. Doolittle, Chairman, C. F. Horne, and J. C. Hunsaker. The task of the Com-

mission, known as the President's Airport Commission, was to consider means to safeguard the lives of people living in the vicinity of airports and to alelviate for them, as far as possible, the disturbance that arises from the operation of aircraft. The report contained many excellent recommendations both for improvement of existing airports and criteria for any future construction of airports. The Commission stressed the urgent need for adherence to their suggestions. The following is a partial list of some of the recommendations which are as applicable today as in 1952 and, where followed, have contributed greatly to aviation safety.

1. Support required airport development: New airports will be needed and present airports must be improved. State, county, and municipal governments should be prepared to assume their proper share of this expense.

2. Expand Federal-aid airport program: Authorization of matching funds for Federal aid to airports should be implemented by adequate appropriations. Highest priority in the application of Federal aid should be given to runways and their protective extensions incorporated into the airport, to bring major municipal airports up to standards recommended in this report.

3. Integrate municipal and airport planning: Airports should be made a part of community master plans completely integrated with transportation requirements for passenger, express, freight, and postal services. Particular attention should be paid to limited access highways and other transportation facilities to reduce time to the airport from sources of air transport business. This we think is most important.

4. Incorporate cleared runway extension areas into airports: The dominant runways of new airport projects should be protected by cleared extensions at each end at least one-half mile in length and 1,000 feet wide. This area should be completely free from housing or any other form of obstruction. Such extensions should be considered an integral part of the airport.

5. Establish effective zoning laws: A fan-shaped zone, beyond the half-mile cleared extension described in recommendation 4, at least 2 miles long and 6,000 feet wide at its outer limits should be established at new airports by zoning law, air easement or land purchase at each end of dominant runways. In this area, the height of buildings and also the use of the land should be controlled to eliminate the erection of places of public assembly, churches, hospitals, schools, etc., and to restrict residences to the more distant locations within the zone.

6. Improve existing airports: Existing airports must continue to serve their communities. However, cities should go as far as is practical toward developing the cleared areas and zoned runway approaches recommended for new airports. No further building should be permitted on runway extensions and, wherever possible, objectionable structures should be removed. Operating procedures should be modified in line with Commission recommendations for minimizing hazard and nuisance to persons living in the vicinity of such airports.

7. Clarify laws and regulations governing use of airspace: Authority of the Federal, State, or municipal governments with respect to the regulation of the use of airspace should be clarified to avoid conflicting regulation and laws.

8. Extend Civil Aeronautics Act to certificate airports: The Civil Aeronautics Act should be amended to require certification of airports necessary for interstate commerce and to specify the terms and conditions under which airports so certified shall be operated. Certificates should be revoked if minimum standards for safety are not maintained. Closing or abandonment of an airport should be ordered or allowed only if clearly in the public interest.

9. Maintain positive air traffic control: Certain air traffic control zones in areas of high air traffic density should be made the subject of special regulations to insure that all aircraft within the zone are under positive air traffic control at all times regardless of weather.

10. Accelerate installation of aids to air navigation: Research and development programs and installation projects designed to improve aids to navigation and traffic control in the vicinity of airports, especially in congested areas, should be accelerated. Installation and adequate manning of radar traffic control systems should be given high priority.

11. Meet standard requirements for runway length: For each category of airport a standard runway length has been established consistent with its future planned use. Airports should bring their runways up to the standard. For intercontinental or transcontinental airports, the length of the dominant runways should be 8,400 feet with possibility of extension to 10,000 feet if later required and with clear approaches are per recommendations 4 and 5. That was written in 1952. Some of our airports need longer runways than recommended at that time.

12. Accelerate ground noise reduction programs: Engine runup schedules and runup locations should be adjusted to minimize noise near airport. Adequate acoustical treatment in runup areas and at test stands should be provided.

13. Arrange flight patterns to reduce ground noise: Airways and flight patterns near airports should be arranged to avoid unnecessary flight over thickly settled areas to minimize noise, but only within the limits of safe flight practice.

14. Minimize training flights at congested airports: Flight crew training should be conducted, as far as practicable, away from thickly settled areas and with a minimum number of flights into and out of busy airports.

15. Separate military and civil flying at congested airports: Military aircraft should not be based on congested civil airports except when it is not economically or otherwise feasible to provide separate facilities for them, nor should commercial aircraft operate regularly from busy military airports.

Unfortunately, little attention has been paid to many of the recommendations and consequently many of the same problems exist today which caused the Commission to be appointed almost 8 years ago. Citizens are still permitted to construct residential housing a few feet from active runways. I mean literally a few feet. Aircraft landing a few feet short of the runway or overrunning the runway a few feet are involved in disastrous accidents. No provision is made in the performance standards for aircraft for any form of moisture on the runway, or any variation in piloting technique. We seem to be capable of constructing thousands of miles of superhighways in

the country but find it impossible to secure another 1,000 feet of concrete on marginal airport runways.

Conflicts and overlapping of authority continue to exist and, as a result, no standards exist in a number of vital areas.

FIREFIGHTING AND RESCUE FACILITIES

An example of lack of standards and overlapping authority in airport facilities lies in the area of the firefighting and rescue facilities maintained on our airports. No Federal requirement for such facilities exists and, to the best of our knowledge, the Federal Government is not even prepared to recommend to an airport operator the type and amount of firefighting and rescue facilities that should be maintained. There is no published information available to the pilot as to the facilities of this type maintained by an airport. A pilot faced with an emergency which may require the emergency landing of an aircraft carrying 125 passengers and 100,000 pounds of inflammable fuel has no information available to him as to the type or amount of firefighting and rescue equipment necessary for his particular aircraft, or the equipment available at nearby airports. Efforts by the association to resolve this problem have been met by the usual difficulties attendant to the divided authority present in dealing with airport problems and the reluctance or failure of the Federal agencies to provide the necessary leadership.

Senator MONRONEY. Could I interrupt there briefly?

In other words a plane in trouble might have an opportunity to select two or three or four operation airports, but there is nothing on the maps or in the Flying Guides that would indicate the best equipped airport if there were a fire aboard or if his gear were stuck and he had to make a belly landing?

Mr. SAYEN. There are no specifications as to what kind of equipment would be necessary for the particular aircraft that he is flying. This can vary widely. For example, the skin on jet aircraft is much thinner than the skin on previous aircraft, so that it requires special sawing devices so that if the exits were blocked on landing you could cut into the airplane and get the people out quickly. This might be one difference.

There is no information available to the pilot as to what kind of equipment he would need for fire and rescue on his particular airplane. And secondly, there is no information available to him as to which airport would have that equipment if he knew what kind of equipment he needed.

Senator MONRONEY. In other words, he can't tell which airport has Foamite and which has an old style horse and buggy fire engine?

Mr. SAYEN. I think I would be fairly safe in saying—and I think my cohorts will uphold my view if I say that the pilot, if he had this kind of an emergency today, he would head for the nearest military airport, not a civil airport.

Senator MONRONEY. It would be a very simple matter to have a four-star mark and three star and so on, to indicate the degree of capabilities of fire fighting apparatus on your airport maps?

Mr. SAYEN. This can be done. We have done a great deal of work on this over the years. We have had an active group working on it

for a long time. There has been some progress made with ICAO in setting up some recommended standards, but there hasn't really been anything done in the United States, except through the National Fire Protective Association, which has tried to bring forth some recommended standards.

Senator SCHOEPPEL. May I ask a question, Mr. Chairman?

Senator MONRONEY. Certainly.

Senator SCHOEPPEL. Do you find that same situation in international airports at foreign countries; are they better equipped than ours?

Mr. SAYEN. I would like to ask Captain Masland to answer that since he flies in and out of them constantly.

Mr. MASLAND. Senator, the information isn't readily available.

Senator SCHOEPPEL. In other words you don't have any definite information on it?

Mr. MASLAND. That is correct.

Senator MONRONEY. You have almost everything else on an airport map except what you need if you are really in serious trouble, with a fire aboard or gear struck or other trouble requiring an immediate landing, is that correct?

Mr. MASLAND. Yes, sir.

Senator COTTON. Many of the small airports, small cities of this country, served by DC–3s, and slightly larger craft, are almost without fire fighting equipment available within a reasonable time, is that correct?

Mr. SAYEN. That is true. Some of them have arrangements with the local city fire department.

Senator COTTON. In your opinion wouldn't it be far more important to devote some of the Federal airport funds which are matching funds, to see to it that all of the airports of any size have fire fighting equipment immediately available before we spend matching funds for terminals and other facilities?

Mr. SAYEN. I couldn't agree with you more. I agree a hundred percent.

Senator MONRONEY. Would you propose, in connection with that, that we should add to the items of eligibility, fire fighting equipment, which I do not believe we do today? The physical equipment of the airport is required to be furnished by the airport itself, and not a matching item.

Mr. SAYEN. Yes. As we point out later in our statement, we feel very strongly that Federal funds should be devoted first to safety items on the airport.

Senator COTTON. It would have to be a sliding scale. I gather from what you say that it wouldn't be necessary for an airport that was served merely by propeller driven planes of the smaller variety, to have the same standard of equipment as the airports served by jets and other large aircraft?

Mr. SAYEN. That is correct, Senator.

What we have recommended is that the Federal Aviation Agency establish a project to set up standards for the communities so that the mayor of X city, who is faced with having to fix the streets and the waterways and the airports and so forth, will know when he spends his money whether he is spending it wisely; whether he is actually buying equipment that will do the job for the particular airport.

But he doesn't have this information currently available to him. And the pilot doesn't have it available to him, either, in the airplane.

I gave a project to our engineering air safety staff quite a long time ago, in which I said I will give you two examples:

You are flying an airplane at 30,000 feet, you have 125 passengers on board and 100,000 pounds of fuel. I will give you two locations, one over, I think it was Dayton, Ohio, and one over Pueblo, Colo. You are going to have to put this airplane down in an emergency and you are probably going to have fire on the crash. Where would you put in?

This created a great stir in our shop. This is a real problem today, as to how do you know where to put it, where your passengers will have a decent chance of being evacuated, even though the aircraft was brought down in such shape that they could be evacuated.

We feel strongly that the critical problems of the terminal area require immediate attention from the Federal aviation agencies and the Congress. The Doolittle committee report should be reviewed, and concrete and specific action taken on the recommendations. We are indebted to this committee for the leadership that has been provided in these areas and for its strong sponsorship of additional Federal aid for the solution of these problems. We are in agreement with the Administrator that airport aid should be expended primarily for safety features, but we cannot agree with his position on reducing expenditures in this area and feel that the problem and the need has been badly underestimated. Anyone who does not agree should try making an approach into some of our airports on a dark, stormy night.

AIR TRAFFIC CONTROL

We do not presume here to deal with the traffic control subject in detail, but broadly.

Fortunately, there was not a collision accident involving air line aircraft during 1959. There were, of course, collisions with other types of aircraft.

Near misses, however, continue to be reported to the association and we have no reason to believe that the number has been reduced from previous years. You probably have not seen as many near-miss reports as in past years since the near-miss reporting program of the Government has been discontinued by the Administrator and any near-miss report received by the FAA under present procedures is, as we have been informed of the policy, automatically reason for beginning an enforcement action against the pilot involved by the Administrator. The net result is that pilots have ceased reporting near misses to the FAA. We believe that this policy of FAA is fallacious and should be reversed immediately. It may make the record look good but it deprives interested and necessary parties of vital information.

Our air traffic is increasing. Our system of air traffic control is essentially the same as it has been during recent years although its capacity has been increased somewhat. New personnel have been added, some additional radar has been added, and several new airways have been designated. Research has been started which will partially automate the work of the ground controller and, hopefully,

expedite communications. Insofar as the pilot is concerned, he is still not provided with the positive separation he feels is required in many areas, his workload in dealing with traffic control has been mounting steadily, and air traffic control delays are long and frequent. The main dependence is still on the "see and be seen" philosophy which practically everyone agrees has not afforded positive separation for many years.

The FAA is continuing efforts toward establishing airways affording positive separation, however, these airways presently are a very small part of the airspace between 17,000 and 24,000 feet on some special airways. On high altitude jet airways above 24,000 feet, we were hopeful that high speed jet transports would be provided positive separation. This is accomplished, in part, by radar tracking and by the installation of transponders on the aircraft. We find, however, that the available surveillance radar does not cover the area adequately and that other aircraft are permitted to operate in the area under visual flight rules. These aircraft do not have operative transponders on occasion, do not appear on the radar screens at times, and, therefore, are not reported to the airline aircraft. Pilots report traffic on these airways on occasion which evidently provide too difficult a problem for the radar operator to interpret for traffic reporting purposes. As an example, one pilot reported hearing the radar operator start a transmission, hesitate, and try it another way about time a jet airplane passed in front and another behind within 1 or 2 miles. Evidently the radar operator was unable to detect the aircraft in time and provide a proper warning to the pilot. The traffic advisories, while not providing positive separation, have increased the communications workload considerably.

The net result of the foregoing is that while some additional assistance is being provided by radar on high altitude jet routes, controlled and uncontrolled traffic is being mixed and a radar advisory service is being provided. "See and be seen" is still the prime system with all its acknowledged deficiencies, especially in high speed jet aircraft, and is the legal philosophy on which the regulations are based. This is far from being a satisfactory situation.

Senator MONRONEY. Before you leave this phase, the aircraft at 24,000—you left the identity of aircraft at 24,000 in a sort of nebulous situation. They would have to be either airline or military planes?

Mr. SAYEN. That is correct.

Senator MONRONEY. So the unidentified aircraft, particularly in the cases you outline, must have been military aircraft?

Mr. SAYEN. Captain Smith?

Mr. SMITH. For the most part, Senator, this would be correct. There have been occasions where the unidentified aircraft as reported from the ground eventually wound up being another airline aircraft at the same altitude. To answer your question I think the majority would be military aircraft.

Senator MONRONEY. Do military aircraft require transponders or are they exempted from the transponder requirement?

To make the record clear, a transponder is a button they can push to give a large blimp on the radar screen, it is not, so you can identify which aircraft you are seeing?

Mr. SMITH. The primary purpose of the transponder is to provide the ground controller, who is seated at the radarscope, a means for maintaining positive identification of a particular aircraft. The manner that this radar advisory service is implemented is (*a*) that a requirement is placed on the military aircraft, if he is operating under VFR flight rules above 29,000 feet, prior to coming closer to 20 miles to an established commercial jet route, to identify himself with a transponder. One of the problems that the military pilots have is that they have no way of assuring that their transponders are working. So that if they do not directly communicate with the person on the ground, it is conceivable that this airplane can enter within this defined 20-mile route without being identified.

The radar controller, not being able to determine altitude from the picture given him on the screen, indicates to him that this is an aircraft not in the band of airspace between 29,000 and 39,000 feet allocated for the commercial jet aircraft and consequently goes unannounced.

This, in reality, then causes the pilots of both aircraft to be required, according to law, to avoid collision by "see and be seen".

Senator MONRONEY. Thank you.

Mr. SAYEN. Somebody handed me this this morning. I remember seeing it before, but not for some time. It might be interesting to you to evaluate the efficiency of the "see and be seen" system for jet aircraft.

The exhibit shows a black dot here. This indicates two jet airplanes approaching each other 2 miles away. This is the actual size that you see. Between the time you see it and you can count 5, 4, 3, 2, 1, it comes through your windshield.

Senator MONRONEY. Do you mean that dot on that is the actual size that the pilot would see?

Mr. SAYEN. That is right.

Senator MONRONEY. In order to make this exhibit that you present, understandable, we are going to try to reproduce it in the record. It is about the size of an overgrown housefly, wouldn't you say?

Senator COTTON. What would be the actual size of the aircraft which this dot represents? As big as a 707?

Mr. SAYEN. I believe so. I believe there is some explanatory material on there. I think that is right.

Senator MONRONEY. You may proceed.

Mr. SAYEN. The pilots of aircraft flying under 24,000 feet continue to report near misses. Under 17,000 feet, there are no positively controlled airways. This association, however, in conjunction with the Air Transport Association, has established a procedure under which our members will not accept visual flight rule clearances above 10,000 feet. Again, however, this only provides protection against other airline flights and nonairline aircraft may and do operate under visual flight rules.

We continue to urge that FAA extend positive separation procedures to all aircraft operating above 10,000 feet as soon as possible.

The FAA has embarked upon a number of long-term research projects which, hopefully, will provide some relief from the present reliance upon an obsolete "see and be seen" philosophy for the maintenance of separation between air traffic. Relief is also badly needed from the cockpit workload engendered by the present cumbersome communication and traffic control procedures.

For the immediate future, however, we see some automation of the ground controllers' function but little relief for the pilot. Radar advisories provide some assistance but still leave the pilot with primary reliance upon the inadequate "see and be seen" concept.

INADEQUACIES OF TRAINING

Insofar as Federal regulations are concerned, when you board an airline aircraft today, you may find the following situation. The pilot in comand will be qualified to operate the particular aircraft and will be so certified by the FAA; the copilot is not required to be qualified to operate the particular aircraft on which he is serving as copilot; and the third crew member is not required to be able to fly, navigate, communicate, or assist with traffic control at all.

In the event of incapacity of the pilot in command for any reason, there is no requirement that anyone be qualified to relieve him.

The modern transport aircraft cannot be flown under complex flight conditions by a single pilot. It is imperative that he have well-qualified and carefully coordinated assistants, and that any incapacitation of a crew member leave at least a minimum crew in control. Yet there is no requirement that any crew member be fully qualified to relieve any other crew member.

The "fail-safe" concept applied to other components of the aircraft is not applied to the crew. By "fail-safe" we mean that a single failure will not result in a major emergencey. The aircraft has to be designed in such a way that if one engine fails, the flight must be sustained by the remaining engine or engines. If the gear will not lower by normal means, an alternate is provided. Any concept under which only one crew member can perform particular functions is unsafe.

Fortunately, many air carriers maintain a level of training well in excess of Federal requirements. In addition, this association has

successfully worked with the management of many carriers through collective bargaining or other processes to provide a higher level of qualification.

Airline flying is a highly skilled profession in an industry of constant technological change. It is imperative, therefore, that adequate and practical opportunity for periodic refresher training in problems not possible of performance in passenger operation be available and that any transition to new aircraft or new devices be accompanied by adequate training.

We have, in addition to our normal programs, conducted a number of industry surveys and detailed studies on these subjects over the years and have had many conferences with the CAB, CAA, and more recently with FAA on the subject.

We have strongly urged regulatory action in these areas to bring the standards of all carriers to a basic minimum.

FAA recently acted on one of our recommendations to require air carriers to submit their training programs to FAA for approval. While the regulation adopted establishes no standard for such programs, we are hopeful that such standards will be developed and that improvements will be made in deficient areas.

The results, of course, will also depend on the capabilities of the individuals working with the carriers in the establishment of the programs and the subsequent monitoring of them. It is unfortunate, however, that despite our repeated urgings this subject has been permitted to drift without any affirmative action by the aviation agencies for many years.

We also urged very strongly that licensing standards for copilots be raised, that copilots be required to possess a type rating on the aircraft on which they are to serve as copilot, and that copilots take proficiency checks each 6 months. Under the present regulations, an individual may be employed with a commercial license and instrument rating on a light aircraft, assigned as copilot with minimum training on the aircraft, and receive no periodic training or proficiency checks.

The Administrator issued draft release 59–3 in June of 1959 which proposed that the copilot be required to possess a type rating and to demonstrate his proficiency each 6 months. We strongly supported this proposal although we pointed out the deficiency in experience requirements for copilot licensing and urged licensing requirements be increased as we had recommended. We commented that the day when pilots could operate their aircraft with minimum assistance and do on-the-job training simultaneously had passed.

The regulations as adopted leave the regulatory situation as follows:

(1) They fail to insure that copilots will be fully qualified on the aircraft on which they are serving as copilot since no requirement is made that they possess a type rating on such aircraft;

(2) The proficiency of the copilot is checked only once per year and only one such check every 2 years needs to be made in the aircraft. Alternate years may be given in the simulator;

(3) The foregoing requirements are not effective until January 1, 1961; and

(4) The third crew member is not required to be qualified to assist the pilot in flying, navigation, communication, traffic management, or other essential flight operational duties. Licensing requirements for copilots have not been altered in any way, and the fail-safe crew is not provided.

We have lost 23 crew members in 13 training accidents over the past 10 years. We believe that the use of simulators for initial and refresher training, particularly during familiarization with a new aircraft, and emergency procedures training can provide a higher level of proficiency and lower casualty levels. Before a pilot is brought down to low altitudes to practice certain dangerous maneuvers, he should have been thoroughly trained in such procedures in the simulator and at high altitudes.

We recommend maximum use of flight simulators as a training device whenever possible. More training can be provided in a simulator at less cost. A simulator may be employed for training in many problems which are hazardous in the aircraft. The result is an increase in the level of proficiency and a reduction in the number of training accidents which, in our opinion, claim too many lives.

Senator COTTON. Pardon me, Mr. Chairman—and it would be very helpful—would you for the benefit of one member tell us what a simulator is?

Mr. SAYEN. It is an electronic training device in which you can simulate the actual operation of the aircraft without leaving the ground. You can set up flight problems for an entire crew, and the controls, the instruments, simulate the actual operation of the aircraft itself. It can be done very well, so that it is quite realistic.

Senator COTTON. Thank you.

Mr. SAYEN. It is very, very good, particularly for practicing emergency situations, which would be most difficult to practice in the air without a dangerous situation.

Senator COTTON. Thank you.

Mr. SAYEN. There is no substitute for adequate training. Some people may be under the impression that you can fly airplanes safely by piling regulation on top of regulation and then having a strict enforcement of the regulations. This is nonsense and can only prove that you can be killed legally. Regulations are necessary in some areas and particularly when they require the installation of minimum necessary equipment, personnel, training, et cetera, to do a job. But when deskbound personnel attempt to set up a rigid pattern and division of duties for the operation of aircraft under all circumstances and the anticipation of all emergencies, we are flirting with death.

When the pilot becomes convinced that he must follow "the book" under all circumstances, even though such action may destroy him and all his passengers, we are flirting with death. When we set up a rigid division of duties in the cockpit based on some preconception, we are flirting with death. The man in control of the aircraft, if well qualified and adequately trained, is the best judge of the proper course of action to be taken in a given circumstance.

The secret lies in such training and not in regimentation.

We have succeeded in making air transportation one of the safest means of travel. This has been accomplished despite the fact that this is potentially an extremely hazardous busines. Accidents have dis-

astrous consequences, and the high safety record can only be maintained by constant exercise of the highest degree of care.

The exercise of such care must be based on knowledge backed with sound judgment. Any action which interferes with that exercise of judgment constitutes a hazard in this business.

THE PRESENT ENFORCEMENT PROGRAM OF THE FEDERAL AVIATION AGENCY

We want to make it very clear at the beginning of this discussion that we are not opposed in any way to enforcement of the regulations. Without enforcement there would be very little purpose in having regulations. We urge, therefore, an effective, rational enforcement program having as its purpose the promotion of high standards of safety in aviation.

We believe very strongly, however, that any enforcement program must be very carefully planned around the primary purpose of the promotion of safety and that each enforcement action must be examined very carefully to determine the overall safety implications of the action. If the result of the action is to convey false information or impressions to the individual affected and his associates that will jeopardize safe operation, these objectives are not being met.

The Federal Aviation Agency has embarked upon an enforcement philosophy during the last year which, while undoubtedly well meant, is not, in our opinion, achieving its overall safety objective. Rather, it has resulted in resentment and anxiety among the pilot group and others who now feel that they are being influenced to a greater level of concern as to whether they are "legal" than whether they are operating safely and within their good judgment.

I had hoped to bring you today, but I forgot, the contents of the pilot's flight kit when he goes on a trip. It is a set of regulations in fine print that run to two or three books and that are about this high [indicating].

The Federal regulations governing the operation of an aircraft are very extensive and detailed. Many of them were written originally as guides to good practice under normal conditions. Many were never intended to be arbitrary laws. With the extensiveness of these regulations, and the extent to which decisions remain a matter of judgment, a flight assignment will seldom be completed without deviation from some rule—if the rule is interpreted arbitrarily or by someone not experienced in the business. In addition, there are numerous rules which are very general, and alleged violations are filed under such general charges as "careless and reckless operation." The net result is that there is a saying in the aviation fraternity that "It is impossible to fly a trip without violating a half dozen regulations." Therefore, if there is to be an arbitrary application of rules as written, the pilots would have no alternative but to insist that many of them be deleted or rewritten.

FAA has expanded very rapidly in recent years and many new people have been employed. I think the figures now are 35,000 people, and I think for the next estimated budget it is to go to 39,000 employees.

Senator COTTON. Over what period of time? Give us an idea of what it was, for instance, 3 years ago, or 5 years ago. We have to think of the FAA as being a new agency.

Mr. SAYEN. The CAA came into being in 1938.

Senator COTTON. When the CAA was replaced by the FAA, how many employees were there? I want to get an idea of the expansion.

Mr. SAYEN. Do you have it?

Mr. SMITH. Senator, I could give you some figures connected with the operating and maintaining of the air traffic control system. I do not have the other. This would give you a rough idea.

Senator COTTON. I am sorry to have interrupted you.

Mr. SMITH. This is one of their documents.

Senator COTTON. I would be glad to have it, but I don't want to interrupt you.

Mr. SAYEN. There is limited opportunity within the Federal Aviation Agency to qualify flight operations personnel in airline-type operations. It is only normal, therefore, that personnel errors will occur and this is recognized. However, the overall enforcement program and philosophy should be such that adequate checks and balances will counteract for personnel errors and that the enforcement philosophy stresses the promotion of safety. This is much too important a subject to be entrusted to new employees without previous civil aviation experience.

We do not believe that it is fair to this committee to take their time to air individual grievances against the enforcement program and we will not do so. Unfortunately, more than half of a statement delivered before this committee was devoted to an attempt to paint certain groups as undisciplined and irresponsible, and many statements from which erroneous conclusions could be drawn were made. No useful purposes would be served by tediously going into each case and allegation and pointing out the errors, the erroneous assumptions, and the obvious fact that many of the complaints of FAA originated within FAA itself. Nor will we recite the series of incidents during the past year which have caused airline pilots to be extremely critical of the inspection and enforcement policies of FAA.

However, several points must be made. In recent months, the Federal Aviation Agency has embarked on a program of widely publicizing in the press every minor action which is taken against an airline, airman, or others. This is evidently to convey to the public the impression that this Agency is the sole protector of the public interest in all matters of air safety against the "irresponsible" airlines, pilots, and other employees. The pilots and the rest of the industry are probably expected to absorb this type of treatment without comment since any criticism of the Agency is met with tirades to the public press spread throughout the country by a large public relations staff at public expense. If the day has come, under our form of government, when individuals or organizations are to be intimidated from making proper criticisms of public officials and their actions, then the cause of safety will suffer badly.

There is no one protector of the public interest in air safety matters. The Congress has imposed a high degree of responsibility for air safety upon the airline companies in granting them their public franchises. A high degree of public responsibility has been placed on the airline

pilot and other licensed airmen, and this individual responsibility cannot be delegated to the employer, to the Government, or anyone else. This association has taken the lead in air safety matters since the inception of commercial aviation in this country and we intend to continue to do so. We are accustomed to public criticism when we champion causes of air safety which may be in controversy. We have learned, however, that the cause of progress is not always a popular one.

NEAR-MISS AND INCIDENT REPORTING

We have mentioned previously that the elimination of the near-miss reporting procedure and substitution of enforcement action has eleminated the reporting of near-misses. It has not, unfortunately, eliminated the near-miss. It has only deprived the Government and others of valuable information. It would be easy to see that people should still report, but impractical to get them to do so.

The following is an excerpt from an Air Safety Bulletin published by one of our Central Air Safety Committees recently which indicates the attitude toward the present FAA program.

NEAR-MISSES

The Central Safety Committee provides every pilot with an easy way to report "near-misses" without the possibility of ending up in an FAA interrogation. Just a note to your local safety chairman stating that a near-miss was experienced and the date is all that is required. This way we can show the industry what the near-miss score is on at least one airline and maybe jar some people who think everything is fine on the airways. The results to date, thanks to the cooperation of all pilots, show that in the past 10 weeks, our airline has experienced 14 near-misses. Included in the tabulation is one report from a DC–8. Let's hope you don't have a near-miss, but if you do, let your local safety chairman know about it.

An enforcement program which shuts off the flow of incident reporting and other vital information constitutes a serious hazard. A pattern of incidents, correctly reported and analyzed, will often reveal a serious accident potential. However, safety experts have recognized for many years that an incident-reporting program must be fostered carefully and that it may easily be destroyed. We have been through this several times in civil aviation.

We urge immediate reinstatement of the near-miss reporting program and the development of an overall program that will encourage the maximum of incident reporting of all kinds in the interest of early discovery of potential hazards. Unless the Federal Aviation Agency plans to grow to a force of hundreds of thousands of employees and inspectors, it cannot substitute itself for the honest and conscientious performance of work and reporting of incidents by the licensed airmen, maintenance personnel and others in aviation. This is a fundamental source of air safety information and any program of the Federal Government which discourages incident reporting and shuts off the flow of vital information to the Government, the airlines, and organizations, constitutes a positive hazard.

In this connection, we have also urged FAA to establish a requirement for the submission of daily mechanical irregularity reports—DMIR's—to FAA and to establish an automated system of analysis of such reports. Presently, the submission of such reports is voluntary and they are only analyzed by personal inspection. Under this system, incidents or irregularities to the same aircraft or component

may be occurring at a dangerous level but on different carriers and much time may elapse or an accident occur before it is caught. For example, when the Electra crash at LaGuardia occurred last year and raised the problem of altimeter irregularity, it was discovered that 21 irregularities with this particular altimeter installation had occurred at various times prior to the accident. The altimeters were subsequently removed.

PILOT ABSENCE FROM THE COCKPIT

During 1959, the Administrator announced that pilots must remain in their seats at all times and enforcement action was taken against several pilots. Such a rule had been part of the regulations for many years and had been applied by the pilots based on their judgment. Now the Administrator was, in an arbitrary manner, to employ an apparently totally different interpretation, but no one has been able to determine what it is. Evidently, whether a pilot exercised good judgment in leaving the cockpit is presently to be subject to someone else's subjective judgment at a later date.

This entire subject would appear ridiculous if it did not reveal a lack of understanding of the entire problem and of the serious safety problems connected with it.

Presumably the rule is to guarantee that there will be two pilots at the controls at all times. The association has strongly advocated for many years that this be done. Unfortunately, adopting the Administrator's interpretation of the rule will not accomplish it and merely creates other hazards and restricts the pilot's judgment.

As a practical matter, pilots must leave the cockpit to attend to their other statutory responsibilities aboard the aircraft, to make equipment and passenger compartment inspections, to maintain order, to navigate, et cetera. In addition, the sensible pilot makes a practice of leaving his seat periodically to stretch, restore circulation, and maintain alertness, and, of course, the lavatory facilities—which usually have a waiting line these days—are in the passenger cabin.

Under FAA regulations covering domestic flying, a pilot may be scheduled for 8 hours of flying during an on-duty period of indefinite duration. Since the rule only encompasses scheduled work, the actual day with weather and delays may run 10 hours or more of flying and 16 or more on duty at the end of which the pilot may encounter flight conditions requiring his highest degree of skill and alertness.

I think it should be obvious that to strap himself in a seat for 10 hours straight, for 16 hours on duty, is an impossible thing. Somebody is going to be absent from the cockpit some of the time. But we think nevertheless we should have two qualified pilots in the cockpit at all times.

Under the FAA regulations covering international flying, a situation exists that is rather hard to believe, and we have been trying to remedy it for many years.

It is still possible to schedule a flight crew for international operations composed of only one qualified pilot in command, assisted by a copilot, and a nonpilot third crew member to fly for 12 hours. Should there be adverse weather or other delays, the pilot may actually fly 14 or 15 hours during a period of 20 to 24 hours on duty. Under

the rules as they exist, if you fly from New York and you go westbound, you can only fly 8 hours but if you go eastbound you can fly 12 hours. Why, we haven't been able to determine. But that is the rule and it has been that way since the early 1940s, and we have been trying to get it changed.

For example, the pilot may be scheduled for a flight of 11:30 with two intermediate stops of 1 hour each. He reports to prepare for the flight 2 hours before departure. The flight departs and 1 hour out develops mechanical trouble and returns to base. Three hours later the aircraft is repaired and the trip departs. Headwinds stretch the flight time to 12 hours and 45 minutes. On arrival at destination, the pilots have flown 14 hours and 45 minutes and have been on duty continuously for 19 hours and 45 minutes. All perfectly proper under the regulations. This problem has been under consideration by CAB and now FAA for 4 or 5 years with no relief. In a jet, 14 hours and 45 minutes is over 7,000 miles of flying.

Senator SCHOEPPEL. After one of these long flights, how many days off does the pilot actually get?

Mr. SAYEN. It depends. Captain Masland is here and he is currently flying these kinds of flights. He tells me that last month he had 6 days off.

Senator SCHOEPPEL. Is that the regular average?

Mr. SAYEN. No, it is not the regular average, but it can happen.

Senator SCHOEPPEL. Let's get the average. Can you give us for the record an average?

Mr. SAYEN. No. In international flying the 85 hour limitation which applies domestically does not apply. So a pilot in a single month may be scheduled up to, I believe, 120 hours of flying. Under the regulations he can fly 300 hours in a calendar year.

Senator MONRONEY. Has Captain Masland flown 24 out of the past 30 days?

Mr. MASLAND. Senator, in the 36 days ending on the 4th of January, I completed 30 on duty days out of 36, and was scheduled for an additional flight on the 4th.

Senator MONRONEY. Is this abnormal, because of the shortage of qualified jet pilots?

Mr. MASLAND. Senator, I have been hoping for almost a year that it was abnormal.

Senator MONRONEY. Sir?

Mr. MASLAND. For almost a year I have been hoping that it was abnormal, but there doesn't seem at the moment to be any end in sight.

The amount of flying involved is relatively small. But the amount of time you put in to get it can be extremely long.

For example, there is an extension of one of our flights that continues on from London into the Continent. You start out a 9 o'clock in the evening. You go to Hamburg, and then to Copenhagen. You get into Copenhagen about 2 o'clock in the morning—you leave actually 2:30 in the morning—and you leave your quarters there at 6 in the morning.

Senator MONRONEY. Wait a minute. You get into Copenhagen at 2:30?

Mr. MASLAND. The last time, Senator, I was there, was 3:15 when I was in the hotel, and the call was for 6. So that it is a——

Senator MONRONEY. Do you mean you are returning a flight with 3 hours' sleep?

Mr. MASLAND. As far as London. In this particular——

Senator MONRONEY. MATS require, I think, a 12-hour layover after completion of a flight and they will not vary it in any way; for the entire crew.

Mr. MASLAND. This particular flight is one of several in which the entire operation encompasses 24 hours, and the total flight time was in the neighborhood of 3 hours, 3 hours and 7 minutes in one case, 3 hours and 54 minutes in another.

Senator MONRONEY. The rest time?

Mr. MASLAND. No, sir, the actual flight time. The rest of the time was in buses or in airports, with several hours to lie down. So that flight time is no true index of the amount of work involved on these new machines, Senator.

Senator COTTON. When you gentlemen refer to flight time, or when the regulations refer to flight time, does that mean actual time that you are airborne, or does it include all the time that you are in the plane, around the cockpit? If you stop at a place for a half hour, or three-quarters of an hour, is that pilot flight time?

Mr. SAYEN. No, it is not. Flight time is defined as only that time when the airplane has left the ramp to taxi out for takeoff, and until it arrives back at the ramp. We call it block to block time, when the engines are started and you leave the ramp, it is clocked. When you arrive back at the ramp and stop the engines, it is clocked again.

Senator COTTON. So that if you stop for 45 minutes to refuel, or an hour to refuel and collect passengers and so forth, and various operations, that is not counted in flight time?

Mr. SAYEN. That is correct.

Senator MONRONEY. Let me get back to this Copenhagen matter. You have flown from Idlewild to Hamburg to Copenhagen in a 707. Then you return that flight to London, is that correct, with 3 hours' rest?

Mr. MASLAND. No, sir. The pattern is not quite like that. It was from Idlewild to London, a rest in London of adequate length, and then a flight from London, starting in the evening, scheduled to return the next morning by 10 o'clock, but due to the weather that we have had this fall and winter on occasion taking the remainder of the day: then getting off and returning to New York the following day.

We have had patterns, however, that have run New York to Paris, Paris to Rome, 4 hours in Rome, and then Rome to Paris. And on occasion following flights of this nature there has been an additional wait at the airport, deadhead by domestic carrier to another airport to take another trip out and return.

So that my point, Senator, is that the recording of flight hours is no index of the total content of what we have been doing. When I say that I was on duty for 30 days out of 36, you might think it was a high number of flight hours involved. It was not. It was in the nature of 95 or 100 hours.

Senator MONRONEY. But 2 hours before departure you had to be there, and there was time in transit from the airport in after you turned the plane over to the servicing crew, and things of that kind.

Mr. MASLAND. That is correct.

Senator MONRONEY. How much time elapses after landing at Rome or Copenhagen before you can leave the plane?

Mr. MASLAND. That is a variable. It is not too long. Thirty minutes or perhaps 45 minutes.

Senator MONRONEY. Are there any records kept of the amount of actual rest time? In other words that you are completely away from the airport in your daily duty performance?

Mr. MASLAND. I don't know of any inclusive records of that nature, Senator.

Senator MONRONEY. It would be possible, though you stayed completely within the flight time, that you might be awake and on connected duty with flying or getting ready for flying, as many as 20 hours out of the 24 on certain occasions?

Mr. MASLAND. That is correct. The place where this has concerned me is the feeling that perhaps more attention might be paid to this area of a pilot's work rather than wondering whether he is going to be still flying at age 60.

The effect on other crew members is something that is easier to notice perhaps than on yourself. I had with me on a recent flight a first officer, a very capable first officer, who was completing four crossings in 5 days. We had flown together. This was our fourth crossing. In 18 days he had made eight crossings, and spent a week in ground school. I could watch the progressive fatigue in the other man, and it eventually resulted in a rather serious failure.

Senator COTTON. A rather serious what?

Mr. MASLAND. A serious failure, the use of two point water injection where the ship was fueled or stocked with only sufficient water for one. With the result that the water ran out at the rotate end of the takeoff run, and the horsepower dropped at the point where you had nothing to do but continue with the flight. We staggered off in daylight, in good weather, fortunately, and made it. I didn't feel that it was the fault of the man. I felt that he had been asked to do too much.

Progressive fatigue in other crew members is readily observed under situations like that. On arrival at London the other day I was reading a magazine and the bus was working its way through very heavy traffic, which meant that it was a very rough ride indeed. Half way into town I turned around and looked at the other crew members. All nine of them were asleep; and at every jolt of the bus their heads wobbled back from one side to the other. And you could only presume that they were either exhausted or dead.

This, Mr. Chairman, is an area which it seems to me would be much more productive of public safety than assuming that stopping flying at 60 would be a cure-all.

Senatir MONRONEY. You say you were coming in with nine crew members, including yourself?

Mr. MASLAND. Yes, sir.

Senator MONRONEY. How many of those would be cockpit employees?

Mr. MASLAND. Four cockpit personnel, and——

Senator MONRONEY. And the other five——

Mr. MASLAND. Six were cabin attendants.

Senator MONRONEY. On the old prop-driven transatlantic planes, many of the airlines carried alternate cockpit crews, did they not?

Mr. MASLAND. They carried multiple crews?

Senator MONRONEY. Yes.

Mr. MASLAND. Yes, sir, with rest facilities for them.

Senator MONRONEY. Because the flight was to take over 12 hours, or apt to take over 12 hours?

Mr. MASLAND. Yes.

Senator MONRONEY. But on the jets, they have the one crew?

Mr. MASLAND. That is correct.

Senator MONRONEY. And not necessarily a proper rest time, you would say, overseas before they resume or fly one leg of the return flight. Of course it is just as dangerous, is it not, if you are fatigued, to take a flight off only from Copenhagen to London as it would be to get up to 30,000 feet and continue across the Atlantic?

Mr. MASLAND. That is correct.

Senator MONRONEY. The landing and the takeoff in these huge planes is a considerable strain on the pilot, and demands his complete alertness at all times, and the other crew members associated with him in the cockpit?

Mr. MASLAND. Yes. Basically, Senator, the actual operation of this ship on a standard flight has much to recommend it. There never was but one captain on any ship I have flown. Which meant that to some degree I was on duty the whole time, regardless of how long the flight was, and some of them went for 24 hours or more. On this ship the flight is relatively short. The equipment is lovely. Beautiful ships. But the scheduling is another matter.

Senator SCHOEPPEL. Can you give us for the record the date on which this flight took place, and your flight time? I would like to have it for the record.

Mr. MASLAND. Senator, I don't have my logbook with me.

Senator SCHOEPPEL. Could you furnish it?

Mr. MASLAND. Yes, sir.

Senator MONRONEY. I think what you want is the 30-day period, with the 24 days of flying. I believe that would be more adequate to get a sample of that.

Mr. MASLAND. I have that, sir.

Senator MONRONEY. Would you say this is somewhat normal in the present operation of jets overseas?

Mr. MASLAND. It is too early to find out whether this is going to continue or not. I have checked the record of my own for a brief 31-day period in which I had 3 days free of duty.

Senator MONRONEY. This was immediately preceding the 36 days?

Mr. MASLAND. No, sir. That was in, I believe, November. It was fairly close to it.

To answer the other statement, I do have an outline of the 36 days which I had mentioned. I should like to point out that at no time during the 36 days was it possible to know what was going to happen the next day.

Senator MONRONEY. Are there any further questions?

Senator SCHOEPPEL. No, sir.

Mr. SAYEN. Under some circumstances people would say that Captain Masland's worrying conditions were because he was a junior pilot. But he has been with Pan American for 25 years.

Senator MONRONEY. I think I had the pleasure of riding with Captain Masland when he made a landing at Le Bourget, in a 707 under low ceilings and a wet runway, and I can testify he did a beautiful job.

Mr. SAYEN. When Captain Masland submits this data, not to be facetious, I hope he will have some form of immunity under violations for careless and reckless operations.

Senator MONRONEY. All we want are the facts, and the facts will give immunity.

Mr. SAYEN. It appears that this don't-leave-your-seat rule applies only if FAA has not approved an operation to the contrary. On certain operations being conducted today, and which have been approved by the Federal Aviation Agency, one member of a two-pilot crew is required to leave his seat in order to perform en route navigation and is, therefore, absent from his flight station approximately 40 percent of the time. This has been brought to the attention of the Federal Aviation Agency but evidently this is an exception to the rule.

Now pilots with 20 and 30 years airline experience and spotless flying records are being threatened with violations for, in their exercise of good judgment, leaving the cockpit for a few minutes. This, in light of the association's position for many years that it was imperative there be two pilots on the flight deck at all times and the recognition that this is only practical with the fail-safe crew previously described in this statement, will make it clear why pilots sharply resent the arbitrary rule.

Much has been made of the dive of a 707 aircraft over the North Atlantic last year which began during the time the pilot in command was absent from the cockpit. The FAA has publicized their action in this incident widely. We would like to point out several facts that were not publicized. At the time this incident occurred, the pilots of this airline, pursuing the policies of our association, had refused to operate the airline aircraft under the conditions approved by the Federal Aviation Agency and the airline because provision had not been made for manning the aircraft in such a manner that two pilots could be at the controls at all times. The aircraft was being flown by management personnel of the company. Their actions were contrary to the policies of the association and association disciplinary action was taken against them for operating the aircraft under such conditions.

Senator SCHOEPPEL. Mr. Chairman, may I ask a question here?

Senator MONRONEY. Yes.

Senator SCHOEPPEL. You probably have these policies established in some type of a memorandum or written form, do you?

Mr. SAYEN. Yes, sir.

Senator SCHOEPPEL. Could you, at this place in your testimony, or following your testimony, by reference, make that a part of your testimony, what the policies are?

Mr. SAYEN. We would be very happy to, Senator.

This particular problem is covered in a rather detailed report of our Training Plans Committee, as it is called. We would be very happy to submit them.

Senator COTTON. What do you mean by the sentence "The aircraft was being flown by management personnel of the company"?

Mr. SAYEN. The pilot in command was a vice president of the company. And the copilot——

Senator COTTON. Is he the one who was absent from the cockpit?

Mr. SAYEN. Yes, sir.

Senator COTTON. So this action was taken against the vice president of the company?

Mr. SAYEN. Yes, sir. The copilot was the director of flying for one of the divisions of the company, on the trip. The airline pilots refused to fly under these circumstances.

When agreements were worked out between the association and the company providing for proper manning of the aircraft by fully qualified three-pilot crews and under conditions under which two pilots could be at the controls at all times, the pilots returned to the operation.

Senator COTTON. Do you mean there was a strike in progress at the time——

Mr. SAYEN. You can call it that. We refused to operate these airplanes until we had what we considered was a proper crew.

Senator COTTON. I see. Thank you.

Mr. SAYEN. It is obvious that the captain could have been absent from the cockpit and his position unprotected as readily under the present interpretation of the rule as formerly. The fine imposed accomplished nothing except possibly to impress the public that FAA was protecting them. How they were being protected is not clear to us. We do not think the fact that no accident occurred had anything to do with the pilot being absent from the cockpit.

Senator MONRONEY. To amplify this, before you go on, this refusal to fly these planes was based on not having pilot-qualified engineers and fully qualified copilots to man the aircraft, is that a correct statement?

Mr. SAYEN. Yes, that is substantially correct.

Senator MONRONEY. It was not a monetary strike for wages or for pay; it was on the feature that you were insisting on, that the pilot, copilot, and whoever occupied the position of engineer, would be fully qualified on the aircraft?

Mr. SAYEN. We were involved in overall negotiations at the time. One of the issues had to do with what we called the fail-safe crew. I think there is no question but what the monetary issue, and so forth, could have been very easily resolved, if the other issue had been resolved.

Senator MONRONEY. Money, though, was involved in the general strike?

Mr. SAYEN. In the general negotiations, yes, sir.

Senator MONRONEY. But not applicable to the overseas operations.

Mr. SAYEN. This could get to be a long story, but we had made a number of proposals under which if the reviewing situations were resolved, the airplanes could be flown by our pilots.

"THE BOOK" VERSUS JUDGMENT

We recently received a telegram from one of our councils which read as follows: "Pilot grounded for refusing to crackup." Subsequent investigation revealed that the pilot during takeoff of a jet aircraft

loaded with 125 passengers suffered an engine failure at a critical point during the takeoff. Actually it was a flameout that he had. Employing sound judgment, the pilot elected to continue his takeoff, successfully did so, and the engine was restarted in the air. In our opinion, and the record of operation with this type of aircraft, had he elected to discontinue the takeoff and attempt to stop on the runway in question, the aircraft and its occupants would probably have been destroyed. On return to base, the pilot found that the FAA agent, who was riding his first check ride on a 707 airplane, had ordered the company to remove him from schedule and to retrain him. The impression was therefore conveyed to this pilot, and all other pilots operating this particular aircraft, that it was more important to follow a rule, a rule dependent on judgment, arbitrarily than to employ sound piloting judgment of an individual experienced in the operation of this aircraft. The company refused the retraining as unnecessary. The company and association intervened, the problem was resolved, and the pilot was returned to schedule.

We are wondering, however, how this pilot and other pilots similarly affected will react in the next such instance when conflict between sound, experienced judgment and a blind following of "the book" is involved. This is one of a number of similar incidents. We realize that these may occur with inexperienced personnel; however, we recommend that procedures be established under which an inexperienced or newly employed inspector be required to discuss fully any complaint or incident which comes to his attention with a competent and experienced supervisor, the individual involved, and other affected parties, before hasty action is initiated and in order that the overall safety ramifications may be properly evaluated.

Senator MONRONEY. To get it in perspective, would you say that the pilot had to make an immediate decision as to the safety of the plane and passengers, that is, to continue the taking off which he felt would be safer in that split second, based on his experience and training, than to try to put the plane back on the runway and to try to bring it to a stop?

Mr. SAYEN. Let me be a little more specific, if you discuss the details. For that particular takeoff the V–1 speed, which is——

Senator MONRONEY. The V–1 speed is when you break ground?

Mr. SAYEN. No, sir. It is the decision speed. It used to be, at least, with old piston aircraft, which was the last point at which you could attempt to stop the aircraft in the event of a failure on the runway. The V–1 speed in this takeoff was 133 knots, close to 155 miles an hour. At 130 knots, according to the captain, and 129 knots according to the FAA inspector—and at this point the airspeed indicator is going like this [indicating]—I mean it is going that fast—the flameout occurred.

The possibility of stopping a large jet aircraft on the runway at V–1 speed, the odds are very, very much against you, and I think the Air Force has reported that they have never fully abandoned a takeoff in one of their heavy jets without destroying the aircraft and its occupants.

So you were within 3 or 4 knots, which is a split second from that point. The captain, of course, had to make an immediate decision, which he did. Fortunately he made the right one.

There are a number of experienced jet pilots here, if you would like to have them comment on this.

Senator MONRONEY. How much of the runway did he have left?

Mr. SAYEN. He had less than half of it left. But there are a lot of other implications of trying to bring one of these large aircraft to a sudden stop. Among other things you practically ruin the airplane. Captain Hopkins——

Senator MONRONEY. Would he not, if he had one motor in a flameout, have had a bad torque if he had put it back on the runway and tried to use reverse power for braking?

Mr. SAYEN. There are many, many problems involved. I would like to have one of the people flying jets other than myself, to comment on it.

Mr. HOPKINS. I am Capt. S. W. Hopkins, Senator, of Delta Airlines. I think in our operations almost 50 percent of the time at V–1, if aborted, you would crack up. The airplanes just don't operate in normal operations the way they do under certification. They are certificated on a flat, dry, concrete runway. We get them on one of these asphalt roller coasters; by the time you reach V–1 the book may say that you can stop, but you look out and you know very well that you are not going to stop on that runway. This is one of those theoretical things. You might as well forget it because the airplane is not going to stop at V–1 in a great majority of cases with our present airports.

The brakeloads that are imposed are such that this is a maneuver that is touched on very lightly in training. I don't think the company cares to, any company, to abuse the airplane to the extent necessary to demonstrate stops at V–1 on minimum length runways. I don't know—what was your experience on Pan-Am, Captain Masland, on the 707?

Mr. MASLAND. Senator, I had five different instructors during my training period. One of them was an instructor supplied by the Boeing Aircraft factory. I asked each one of them in turn to demonstrate a V–1 refusal of a takeoff. That is, a takeoff, normal up to this V–1 speed, and then a refusal and decelleration on the runway. All five of them refused to demonstrate it. The curves in the Boeing manual show that a full loaded 707, 321, the energy absorbed is in the nature of 20 million to 30 million foot-pounds per brake and the instructions contained in the manual are that if you have such occasion to attempt such a stop, that you get the thing off the runway as fast as you can and abandon the ship; that the entire undercarriage must be replaced. It is not an operation that you willingly conduct.

Mr. SAYEN. We also urge Government inspectors be provided with proper qualifications in order that they are competent to evaluate the overall safety significance of a particular problem.

In this regard, maximum use should be made of the experienced, competent, and currently qualified inspectors and check pilots of the airlines whose work can be standardized by cooperation with the Federal Aviation Agency. This is the system of inspection, training, and standardization that has been most successfully employed in the past. For the FAA to attempt to acquire, train, and keep currently competent sufficient personnel to duplicate the air carriers' supervisory staffs is an unwarranted and unnecessary expenditure of public funds that could better be employed elsewhere.

In this connection I believe FAA currently has one inspector who is qualified to airline standards, and he was qualified by the airlines. They have, I think, according to the testimony here, 14 people who have been through the Castle Air Force Base on the KC–135 program. This training is good. We encourage it. But it is almost impossible for them to acquire training and keep competent people to the current level of standards. So the system has been employed over the years to designate the airlines' supervisory personnel, who have the identical job for the airlines, of inspection, training, as inspectors for the Government, operating under the supervision of FAA people in accordance with their standards.

We think this is a much superior system.

Senator MONRONEY. If I remember the testimony, I believe General Quesada testified that less than 20 percent of the check rides are done by his personnel, the other 80 percent still being done by the company's check pilots.

Mr. SAYEN. I think it is probably smaller than that. I think probably even a larger percentage is done by the airline personnel who are designated by FAA for that purpose, and must qualify for that purpose.

In a number of recent incidents where an aircraft has experienced an obvious mechanical failure—by this we mean one that is well known to everybody—the pilot of the aircraft has been subjected to flight tests.

This is similar to becoming angry with your wife and kicking the dog. It serves no safety purpose. This should be immediately discontinued.

Senator MONRONEY. Would you care to elaborate on that?

This mechanical failure would be in the maintenance department, would it not, and not a subject of the pilot's responsibilities?

Mr. SAYEN. Evidently there is some general rule that if there is an incident, that you check the crew before they return to schedule.

But in those cases where it is obviously a mechanical failure and everyone can see it—and we had two about a week ago in which a drag strut broke on two airplanes the same day, I believe, in both cases it was perfectly obvious to everyone what happened.

You could see it. In both of these cases the flight crews were taken out and rechecked for competence.

Senator COTTON. I think your point may be good, but I think your illustration is terribly poor. Because if you get angry with your wife and kick the dog, I think it is a wise procedure.

Senator MONRONEY. Is this a landing gear difficulty that you are speaking of?

Mr. SAYEN. Yes, sir; a drag strut on the Constellation.

Senator MONRONEY. That led to putting a number of them on jacks and going over the whole business?

Mr. SAYEN. The whole fleet was inspected subsequently.

Senator MONRONEY. All the pilot does is push the gear lever, and if the gear does not go down he would have failure?

Mr. SAYEN. Yes, sir.

Senator MONRONEY. But if he failed to put it down, he should have a check ride?

Mr. SAYEN. Yes, sir.

Senator MONRONEY. I believe for the convenience of the members of the committee and others we will recess at this time. You will be available at 2 o'clock?

Mr. SAYEN. Yes, sir.

Senator MONRONEY. We will be in recess until 2 o'clock.

May I say that if we are approaching several votes, we may have to secure a room where we can have these hearings over in the Senate side of the Capitol. We will try to post that notice here at the committee prior to 2 o'clock, if it is changed. If it is not changed, it will be here.

(Thereupon, at 12:15 p.m., the subcommittee was recessed, to reconvene at 2 p.m. of the same day.)

AFTERNOON SESSION

Senator MONRONEY. The subcommittee on Aviation will resume its hearing.

At the time of our recess this afternoon we were hearing the statement of the president of the Air Line Pilots Association, Mr. Sayen.

I believe you were on page 32 of your statement. You may resume, Mr. Sayen.

Mr. SAYEN. Thank you, Mr. Chairman.

The next category problem is rulemaking.

The Federal Aviation Act of 1958 transferred complete authority for rulemaking to the Administrator of the Federal Aviation Agency. No appeal from the actions of the Administrator is provided except the limited appeal provided under the Administrative Procedure Act. This act does not permit review of the Administrator's "interpretation" of rules already in effect; in consequence "new rules" may be written in the guise of "interpretations" from which no right of review exists.

The Administrator may arbitrarily make any rule he desires, and his only obligation is to provide notice and to give the parties the opportunity to submit written comment. Hearings may be provided at the discretion of the Administrator and, when provided, may only provide the parties an opportunity to voice their views and are not for the purpose of developing evidence in the normal legal process.

In effect, the Administrator becomes a complete czar over the entire aviation industry and may make any rule he desires, subject only to compliance with the time limits of the Administrative Procedure Act, and that may only occur in those cases where the Administrator determines that the particular rule is not merely an interpretation of a previous rule.

We urged before Congress when the Federal Aviation Act was being considered that, while the Administrator should have rulemaking authority, an appeal from his decisions should be provided. Experience under the act to date has not altered our view but rather has strengthened it.

We believe that it was the clear intent of Congress to preserve the right of any airman or air carrier to appeal to the Civil Aeronautics Board in any case where their individual certificate was affected. We pointed out at that time, and experience has confirmed, that providing the Administrator with arbitrary rulemaking on one hand would give him the power to negate the appeal provisions of the act on the other.

For example, the Administrator may promulgate a rule which places a limitation on an airman's certificate and, since this is accomplished under the rulemaking authority of the Administrator, he may contend that the appeal provisions do not apply.

On the other hand, an individual who has been affected by a rule of the Administrator and makes an appeal under the existing rule to the Civil Aeronautics Board may find that, while the appeal is pending, the rule has been changed and, even if his appeal is successful, his case is lost.

We feel, therefore, that providing arbitrary authority to the Administrator on the one hand and attempting to maintain the right of appeal on the other is a most difficult if not an impossible undertaking, and that it would be more practical if the right of appeal was preserved in all such matters.

As we contended during the consideration of the Federal Aviation Act, this would not hamper the efficient functioning of the Federal Aviation Agency but would serve to maintain the checks and balances necessary to preserve individual rights and avoid possible abuses.

Senator MONRONEY. At the time the Federal Aviation Act was introduced in the Senate I believe it did provide for a review by the Civil Aeronautics Board, on the request of any interested party, when a substantial economic hardship occurred without sufficient cause, is that correct?

Mr. SAYEN. That is correct. And during the revisions of the act as it went through the congressional processes, this was deleted. We opposed it wherever possible, but it was still deleted.

It was contended then that it was impractical. We feel even more strongly today that it should be a part of the act.

We will comment briefly at this time on the rulemaking during 1959, and since the FAA was created and return to these subjects in detail at a later time.

A number of these subjects will be covered in subsequent hearings, as I understand it, by this committee.

On January 4, 1960, the Federal Aviation Agency issued a press release listing what they considered their major accomplishments during 1959. The following rules were listed:

1. Mandatory retirement age for air line pilots: FAA characterized this as "the most significant" of a number of changes in rules and regulations affecting air carrier operations. The rule, effective March 15, 1960, provides that "No individual who has reached his 60th birthday shall be utilized or serve as a pilot on any aircraft while engaged in air carrier operations."

We are unable to find any air safety justification for this rule. No accident or incident occurred during 1959 or any other year which has been attributed to the age of a pilot. The only pilots who could be affected are those who have been certificated as healthy and competent by the Federal Aviation Agency and their employer.

No accident has ever been attributed to the chronological age or the physical breakdown of a pilot. The only individual affected would be one who has met all of the requirements laid down by the Government for his license and who has met all of the requirements of his employer.

The Administrator freely admits in the notice adopting the rule that there is no evidence on which to base this rule.

The rule does not revoke or suspend the pilot's license. The rule is directed at the air carrier and merely prohibits the carrier from utilizing the pilot. It is, therefore, an arbitrary order from the Administrator to the operator to discharge a competent, healthy, and fully licensed pilot.

The rule applies only to carriers operating under parts 40, 41 and 42 of the Civil Air Regulations. The same pilot, therefore, is fully licensed to operate any type of aircraft in general aviation and to fly passengers such as corporation executives, the President, Senators, or anyone else.

Senator MONRONEY. Doesn't it make any distinction between cargo and air passengers?

Mr. SAYEN. No, sir. The carriers operating under 40, 41 and 42 may not use the man.

Senator MONRONEY. What I am getting at, if it is a scheduled airline and flying all-cargo planes, they would still be barred. Would it apply to non-schedules?

Mr. SAYEN. Yes.

Senator MONRONEY. It would apply there, too?

Mr. SAYEN. Yes, sir. But he could fly corporation aircraft, private aircraft; he could fly by himself; he could fly as part of a crew, in that type of aviation.

Senator MONRONEY. How about charter?

Mr. SAYEN. Charters, yes.

In adopting this rule, the Administrator has made no attempt to provide for the individuals affected. Some pilots will be forcibly retired by the rule without any retirement income. Some will have a retirement income approximating 5 to 10 percent of their final earnings.

Social security is not available under age 65. To this date, the Administrator has not recommended to the Congress that the social security age for pilots be revised, or to the Civil Aeronautics Board that air carriers be required to provide minimum pensions.

There is no precedent in our Government for this action.

Senator MONRONEY. Is it a fact that your own pilot retirement program, which I think is a part of your general association activities, is now formulated with no retirement income before 65?

Mr. SAYEN. There are no compulsory retirement ages for pilots in any of our contractual agreements with any of the airlines. The calculated age under the retirement plans that have been negotiated, the age for calculation purposes, is 60, in some of them—most of them. There are some of them where the pilot would be expected to fly until age 65. But some airlines have no retirement programs for the pilots. Some of them have been adopted so recently that a pilot hasn't had an opportunity to accumulate retirement income to any amount.

Senator MONRONEY. Have some of the airlines had a compulsory retirement age above 60?

Mr. SAYEN. No.

Senator MONRONEY. At the instance of their own company program?

Mr. SAYEN. There have been some airlines which have attempted to establish 60 as the retirement age as a matter of company policy.

These cases have been arbitrated between the association and the company. There have been two such arbitrations and in both cases the arbitrator found that there was no legal basis for the company to do this, and in one of the cases he found there was also no practical basis for the company to do this. In other words the arbitrators have found against it.

Senator MONRONEY. I am assuming that there is no requirement in company rules and regulations or procedures that today ground the pilot at 60?

Mr. SAYEN. No, sir; there isn't. Not as long as he is healthy and competent. He must meet both the company standards and the Federal Government's standards, physically.

Senator MONRONEY. That is based on the individual's examination and not on a class?

Mr. SAYEN. Right. There is no precedent in our Government for this action. We have searched both congressional records and records of the agencies. For that matter, the Congress and various agencies of the Government have very active programs to preserve and utilize the skills of the older competent worker.

This rule, since it does not deprive the pilot of his license, has the effect of placing a limitation on his license. We believe it was the clear intent of Congress that a limitation may be placed on a pilot's license only by individual hearing under section 609 of the act and with full preservation of the individual's appeal rights. We believe that this is an instance of the Administrator using the rulemaking procedure to take to himself authority which was reserved to the Civil Aeronautics Board, and to circumvent the clear intent of Congress to preserve individual rights of appeal in any case affecting an individual's certificate.

The air carriers and eventually, of course, the traveling public, must pay for this arbitrary action of the Administrator by losing the services of trained, experienced, competent pilots and having to train replacements and by replacing the income of the individuals affected.

From statements issued by the Administrator in the adoption of this rule, presumably his concern stems from the increased danger of in-flight incapacitation of the older pilot. To the best of our knowledge, we have conducted the only detailed study made in this industry on pilot incapacitation, and the results of our study show that in-flight incapacitations of pilots are a very real problem and occur frequently. However, they occur most frequently from such everyday causes as food poisoning and diarrhea and so forth which are not related to the age of the pilot. Incapacitation can happen at any age.

However, even if we take coronary failure as the measurement, we find, for example, that there will be five times as many coronary failures among pilots in the 45–49 age bracket as in all pilots over age 60 in 1962. Those figures are based only on general averages. If you took pilot averages, where you give a regular electrocardiogram and physical examination, the figures would be different.

It is obvious, therefore, that the rule of the Administrator will do nothing to provide against the very serious problem of in-flight incapacitation of a crew member.

Senator SCHOEPPEL. Mr. Chairman, I would like to ask a question there for the benefit of the record at this point.

Senator MONRONEY. Senator Schoeppel.

Senator SCHOEPPEL. While I haven't been attending all of these hearings, I have been trying to follow the record closely.

Is it not the case that the Air Transport Association, the Civil Aviation Medical Association, and the Flight Engineers International Association, have commented favorably upon the 60-year limitation?

Mr. SAYEN. Yes, I think that is accurate. I think there were individual examiners who commented against it. But I think their association probably commented for it.

In all of these comments they admitted, however, the arbitary nature of the rule, and the fact that there was no evidence on which to base it.

Senator MONRONEY. I would like to read into the record at this point a report of the Civil Aeronautics Board, Bureau of Safety, Safety Analysis Division, August 13, 1959:

A table showing the accidents involving pilot casuality factors in scheduled domestic carrier operations from 1951 to 1958—total of all accidents—from 1951 to 1958, in the number of accidents, and the percentage.

I will read the number and the percentage.

In the 25 to 34 year old brackets, 34 accidents, 23 percent in this age bracket.

In the age bracket 35 to 44, 84 accidents, 64 percent of the total accidents in that period.

Age bracket 45 to 49, 13 accidents, 10 percent of the number.

Fifty to fifty-nine, number of accidents, three, 2 percent.

Not known, and I presume that is age, one accident, 1 percent.

So you have a total of 132 accidents in which the highest bracket was 35 to 44, and the next highest was 25 to 34; going down to 2 percent between 50 and 59 years of age.

Mr. SAYEN. Thank you, Mr. Chairman. I think the point is significant here. While I didn't intend to go into this in detail, and hoped to go into it in a later hearing—that the individual pilot who has reached the age of 60 is an individual who has survived all of the elimination tests over a long period of time. So if anything is turned up in his physical condition or his proficiency over the years, he has already been eliminated. So the individual who has gotten through to the age 60 is quite an individual.

Senator MONRONEY. There is quite an elimination in sight, hearing, and various other things that catch them on the physical, even though it may not be a cardiac or something of that nature, is that correct?

Mr. SAYEN. That is right. There is no means of indicating that the average pilot will ever get through to age 60. The man who gets through to age 60 is a very unusual case.

Senator MONRONEY. A lot of them, if they do feel themselves becoming less physically capable of flying, may ground themselves. Is that an experience that you have had, I imagine in large numbers?

Mr. SAYEN. Yes; it is very true. Oftentimes the individual retires voluntarily because he has had enough flying.

There is, however, a very real and practical way of providing against in-flight incapacitation, which is a serious problem, and we have previously discussed in this statement the concept of the "fail-safe crew" in which each flight crew position is capable of being filled by more than one flight crew member.

No contribution to air safety has been made by this rule and no accident which occurred in 1959, or for that matter in any previous year, would have been prevented by it.

Senator MONRONEY. You say "fail-safe crew". What you are talking about is always two men who are capable of flying the plane under normal flight conditions?

Mr. SAYEN. That is right.

Senator MONRONEY. That would probably—to make clear what we are talking about, a pilot qualified in the engineer's seat, is that correct?

Mr. SAYEN. Yes, sir.

Senator MONRONEY. Is it possible with the present configuration of the cockpit that the engineer's table could be left empty and the engineer assume the controls without affecting the flight of the plane?

Mr. SAYEN. In most airplanes, yes.

Senator MONRONEY. In other words there are dual throttles, dual controls and so forth that the engineer manipules in flight, that are also in the vicinity of the pilot?

Mr. SAYEN. In most airplanes, yes.

If something happens to the captain, which may be an every day thing like a stomachache, toothache, a bird through the windshield, or diarrhea, which is one of the most common things, or food poisoning, the copilot is fully qualified to operate the airplane and has the assistance of another man who knows how to fly. Or of course any other crew member, it should be equally as true. The captain and copilot should be fully qualified in any engineering problems that may arise.

2. Copilot qualifications: As discussed previously, the rule, as adopted by the Administrator, fell far short of his proposal. A type rating is not required and a proficiency check is only necessary once every 2 years in an aircraft provided, during the intervening year, such a check is given in a simulator. We are hopeful that the Administrator will see fit to return to his original proposal since the rule adopted will not provide the level of training and qualifications necessary, the fail-safe crew is not provided, no protection is provided against incapacitation, and the qualified pilot is not guaranteed adequate assistance to do his job.

Senator MONRONEY. I got the feeling in the testimony, and I can't pinpoint it, that General Quesada had said that they had upgraded greatly the responsibilities, training and capabilities of the copilots to where, aside from the distinction of being a pilot in command of the ship, they were otherwise as well qualified to handle the plane under any conditions as the pilot. How does this statement—and I have briefly interpreted it—differ with what you are saying, that he is still not necessarily proficient in the full control of the plane?

Mr. SAYEN. If the individual is to be proficient as the pilot in command, then you might as well give them the licenses, also. But as the regulation now reads, and it is now effective until January 1, 1961, as the regulation now reads, an individual who would have a commercial license which might be acquired on a light aircraft such as a Piper Cub, and an instrument rating, may be employed as a copilot and may be given some indeterminate amount of training and assigned to an aircraft as a copilot in which he is not qualified.

We do have this fact, as I am going to discuss under No. 3, that the Administrator now wants training programs of the carriers submitted to him for approval.

Senator COTTON. Did you hear General Quesada's testimony?

Mr. SAYEN. No, I did not.

Senator COTTON. It is my recollection, Mr. Chairman, that he said—and I may be wrong, too—that it was their purpose to require copilots to have every qualification except the requisite number of hours that they require of a pilot.

Senator MONRONEY. My recollection is that is was a distinction without a real difference, excepting the command pilot carried the distinction of being the ship's master and the copilot was the first mate, both having to pass the same qualifications and tests with the exception of the basic long hours of experience in command of an aircraft.

Mr. SAYEN. We hope that this turns out to be the situation.

Senator MONRONEY. I am trying to find this in the record. I think it is very important. I gathered from the testimony of General Quesada that he is trying to reach for the same thing that you are reaching for, a fail-safe crew, at least as the second officer in the plane.

Mr. SAYEN. If this is true, then I believe that it should be written into the regulations as such, because this is not what the regulations say. This is what was proposed by the Administrator, but the rule which emerged subsequntly was quite different.

Senator COTTON. In order to be a pilot in command, he must not only have certain training, certain familiarity with the type of ship you are piloting, but you also have to have to your credit a certain substantial number of hours in flying that type of ship, is that right?

Mr. SAYEN. No, sir. In order to serve as a pilot in command you must have an air transport rating, which you can only get with a minimum of 1,200 hours of flight experience. Then to serve as pilot in command on a particular aircraft you must have what is called a type rating, which means that you must be licensed to operate this particular aircraft. You have to take tests to demonstrate that you can, in fact, operate this particular type of aircraft. And your proficiency is checked at least every 6 months.

Senator COTTON. What constitutes the training required in that particular type of aircraft for a pilot in command, licensed to command that particular type of aircraft?

Mr. SAYEN. Enough training so that you can pass the test for a type rating on that aircraft. That might vary from pilot to pilot.

Senator COTTON. With no fixed number of hours at all?

Mr. SAYEN. No.

Senator COTTON. In other words, if a pilot has had long experience, we will say, in piston type planes, and has had some experience with turbojets, and then the time comes to fly the jets, all he has to do is to be familiar enough with a jet to pass certain examinations. It might be as short a period as 10 days—a week or 10 days training—2 or 3 days, or as long a period as a month, depending on his capability, is that correct?

Mr. SAYEN. That is substantially correct. It depends on the individual's background, experience, and so forth. He should go through a training program to prepare him to take an examination for a type rating. Then he must pass these examinations for type rating. Then

ordinarily when he flies a new type of aircraft he will fly it for a certain number of hours with a check pilot.

Senator COTTON. That is what I am talking about. He has to have a certain number of hours of actual flight experience, under supervision, in the new type before he is type rated for that aircraft.

My impression was that the difference between what the Administrator was testifying and what you are testifying is that the copilot had to have everything except that last, and he got that last flying with the pilot. I mean in actual experience.

Mr. SAYEN. If this is true, this is different than what the regulation reads, and I hope this comes about. But if it comes about then they might as well give the pilot the type rating.

Senator COTTON. He couldn't have the type rating until he finished those hours.

Mr. SAYEN. In licensing it doesn't work that way.

Senator MONRONEY. The type rating, may I interject, doesn't seem to me to be very long. American Airlines waived the extra 100 feet required on instrument landings for the pilot of the Lockheed Electra that crashed, with only 11.8 hours on that aircraft.

The figure I quoted was wrong. It was 12.32 hours in flying the Electra in scheduled operations, instead of 11.8.

Mr. SAYEN. Maybe I can back off and give one more example of how this works. If I were a pilot in comand, flying DC–7 aircraft, and then I was going to be assigned to fly the 707, I would go to training school on the 707 until the training program felt that I was ready to take my type rating certificate. I would take this examination. If I acquired the certificate I would go into line flying on the airplane under the supervision of a check pilot. This varies from time to time. Ordinarily on jets I believe they are flying 50 hours line lying under the supervisor pilot. The copilot, under the regulation, as adopted, does not go through this procedure.

Each 6 months my proficiency would have to be checked. There is no provision—the copilot would be checked once every year under the regulation, but it only has to be in an airplane once every 2 years.

The next rule adopted by the Administrator in 1959:

3. Approval of carrier training programs: We have previously discussed this rule. No curriculum or standards of training have been specified as yet but we hope to work with the Administrator to make this rule meaningful.

4. Medical revisions regarding diabetes, mellitus, coronary heart disease, psychosis, et cetera: As far as we know, this rule would not have prevented any air carrier accident which has occurred in commercial air transportation in 1959 or any previous year.

Senator MONRONEY. On that point, Mr. Sayen, you would say that a man with a previous history of a coronary, would probably not be employed by an airline as an airline pilot, wouldn't you?

Don't they go into the background of the pilots very carefully? So this, while it does affect adversely many private pilots, or charter pilots or others, the airlines have screened all the men in this field pretty well themselves.

Mr. SAYEN. That is true. No airline would hire an individual with these disabilities in the first instance. The only problem that might arise is where some individual, as the years went by, picked up one of

these things—and of course all of them have tremendous variations of severity.

Whether you can be completely arbitrary in these fields is a question. I have not commented on this except that no accidents were ever attributed to this.

Senator COTTON. You have not as yet definitely decided to oppose this rule?

Mr. SAYEN. When the rule was adopted we did not take opposition to it as such. But I would say that there are tremendous variations in these things as they occur. In heart situations there may be very, very minor damage, in which the individual makes a marvelous recovery. The possibility of his having another attack is as remote as someone else's because he then takes very, very good care of himself. These things do occur.

5. Airborne radar: We have been strong advocates of this rule and welcome its adoption although we regret that time limits were not more stringent and hope that it will soon be extended to accommodate cargo aircraft, C–46 and DC–3 aircraft.

Many models of cargo aircraft are now operating, and will be operating, on the Nation's airways, and this essential protection for the crew, the airframe, and people on the ground should be provided. We have never been able to see the justification for differentiation between the airworthiness standards applied to passenger aircraft and cargo aircraft for any purpose, and can see no justification for this differentiation.

Similarly, the DC–3 and C–46 operate under conditions where airborne radar is very badly needed and these aircraft will be utilized in such operations for many years in the future.

You will recall under rulemaking this subject was left open for further considerations. We hope it is considered.

Airborne radar has been a policy objective of this association for many years and we urged the Civil Aeronautics Board and later the Federal Aviation Agency to propose and adopt this rule. It is our intention to monitor very carefully the operational rules which are to be established under the regulation for the use of this device, which is probably one of the most important contributions to air safety in recent years and which, had it been in operation during the past 6 years, would have, according to our files, prevented 7 accidents, 187 fatalities, and millions of dollars of cost in aircraft damage and deviations from planned flight routes.

6. Consumption of alcoholic beverages: The Administration has adopted a rule which provides:

> (*a*) No person shall drink any alcoholic beverage aboard an air carrier aircraft unless such beverage has been served to him by the air carrier operating the aircraft.
>
> (*b*) No air carrier shall serve any alcoholic beverage to any person aboard an air carrier aircraft if such person appears to be intoxicated.

We do not believe that this rule, as adopted, will contribute to air safety. It condones the consumption of alcoholic beverages on aircraft and goes so far as to provide that the passenger may bring his own liquor supply on board and have it served to him by the flight attendants.

The determination of intoxication has always been a very complex legal problem and the judgment as to whether an individual has achieved this state is now placed entirely on the flight crews.

Presumably, if the flight crews do not carry out this responsibility, they are subject to violations. If they do carry out their responsibility, they must file the complaints against the individual affected—who may be one of the airline's best customers—and appear in the legal proceedings against the individual.

It is obvious to us that this method of enforcement is completely impractical and the regulation merely indicates that the consumption of alcoholic beverages on board aircraft will now be condoned and that there is no effective method of preventing it.

In our view, this regulation weakens the previous regulation which provided that—

> A pilot shall not permit any person to be carried in the aircraft who is obviously under the influence of intoxicating liquor or drugs, except a medical patient under proper care or in case of emergency.

We cannot view this rule as any addition to safety. It does, however, place the FAA in the position of having a regulation on the books in the event a disastrous accident results from the consumption of alcoholic beverages. Obviously, the person who became intoxicated and interfered with the safety of the flight had been doing so contrary to the regulations and the flight crew had not been carrying out their assigned responsibilities to prevent intoxication.

An accident arising from alcoholic consumption will obviously be attributable to flight crew error.

In summary of the rulemaking record in 1959, we must conclude that excluding the rule of airborne radar and the possibility of some help from the requirement that training programs be approved by the FAA, the Agency in its rulemaking seems not to have diagnosed the needs of the industry during its first year of operation.

Rather than coming to grips with the basic immediate needs of air safety, the emphasis seems to be on long-term research programs which hopefully will produce some result in the indeterminate future and an enforcement program which hopefully, in some way, will compensate for some of the inadequacies without removing the basic problems.

Excluding the rule requiring airborne radar at a future date, none of the rules adopted would have prevented any of the accidents which occurred in 1959.

The installation of needed aviation facilities flowing from increased appropriations by Congress and the activity of some communities will be very helpful but should be greatly accelerated.

Senator MONRONEY. In order to be fair with the FAA, between now and the time we undertake the review of pilot qualifications, if you have time to read in its entirety General Quesada's statement which I have just scanned through again, I think you will find that you are both heading in the same direction. This has no goal of January 1961, so that copilots today would not be kicked off the lines because they could not immediately qualify for the same standards practically as demanded of a command pilot.

I can't see very much different, having scanned this very rapidly, between what General Quesada has in mind in connection with this and what you have in mind.

I think you both want the same fail-safe crew.

Mr. SAYEN. Mr. Chairman, if Mr. Quesada has in mind giving this individual type rating on the airport, then I think it should be put in the regulations wherever one understands it, and not be subject to an interpretation that FAA may vary from day to day.

Senator MONRONEY. I think what he is doing, as I understood, in rereading his testimony, is drafting the training programs for the proficiency requirement of air carrier pilots other than the commander.

I mention this because it is highly important, the man is doing his dead level best in certain areas, and he should be complimented instead of criticized.

I do want to keep the record straight as we go along.

General Quesada said—

In order that it might be clear I might read a statement knowing that this is coming up. On December 1, 1959, the Federal Aviation Agency issued a civil air regulation to strengthen the proficiency requirements of air carrier pilots other than pilot in command. The rule established new, greatly strengthened standards of competence for both the second in command and other pilots. The new regulation for the second in command requires that he receive specific flight instructions and practice in certain maneuvers considered essential in order to be certain that he is competent to pilot and navigate the aircraft, including instrument conditions. He must demonstrate this proficiency either to a check pilot or to a representative of the Administrator; and must do so in each type of airplane in which he is to serve.

In order to assure that he continues competent, he must demonstrate each 12 months satisfactory accomplishment of a proficiency check. The training program for the second in command, as well as other members of the flight crew, must meet with approval of the Administrator.

I think we are getting to the point we are both talking about. Then the record reads along:

Senator SMATHERS. The date of this letter is what?

Mr. QUESADA. This is not a letter.

Senator SMATHERS. The date of the regulation is what?

Mr. QUESADA. December 1, 1959.

As the committee well knows, it is impossible to legislate proficiency overnight. The proposed rule requires the establishment of comprehensive training programs by the air carrier, and the adequacies of these programs must be reviewed and approved by the Agency.

The air carriers are required to submit the curriculum of their training program for such approval not later than May of this year. It will then be necessary for us to review and approve these training programs. Thereafter, the programs must be put into effect and the actual training accomplished before the pilots in question can be expected to meet the new proficiency requirements. All pilots utilized as second in command by air carriers, commencing January 1 of next year, must have had the prescribed training and satisfactorily passed the new proficiency check. Thereafter they must be kept current by passing proficiency checks every 12 months. The basic difference between the requirement of captain and the second in command is that the captain has an ATR, and the second in command does not.

Senator SMATHERS. What is an "ATR"?

Mr. QUESADA. Air transport rating.

Senator SMATHERS. The second in command does not have an air transport rating?

Mr. QUESADA. He is not required to have an air transport rating. But he is required to meet a specific training program that we have prescribed, and a proficiency check.

There is more to it.

The burden of it is that he must be qualified with the exception of certain additional time under the hood, and things of that kind, as to the competency of a pilot in command.

If this is the direction this is taking, then you heartily approve of more and more training, competence, and current knowledge of the aircraft for the copilot?

Mr. SAYEN. Yes. I should clarify something else, in the event the wrong impression might be left here.

As I said earlier in the statement, many air carriers maintain training programs far in excess of those required by the regulations, or have been required by the regulations.

On the jets, for example, many of the copilots are pilots in command on other airplanes, have flown as pilots in command on other airplanes. And of course many of our copilots are very well trained and qualified people.

Senator MONRONEY. Many copilots can carry an ATR in their own right, and do fly as copilots because the command pilot position may not happen to be open on the line at the time.

Mr. SAYEN. That is right. Under many of our collective bargaining agreements the company is required to give the man an air transport rating within a certain amount of time after he has been employed by the company.

Part of the problem rises in securing for this man periodic training, periodic refresher training. One of the advantages in having a 6 months proficiency check is that it gives an opportunity to do some of the flying which he can't do on the line with a load of passengers in the airplane.

This is very helpful. I hope we are going in the same direction here. If we are, then I would hope that it be set down, very definitely, so we all know what it is, and not be left in some nebulous state where it is the judgment of some individual inspector or some individual as to what this standard of training is going to be, so that it will vary tremendously from carrier to carrier.

It should be standard.

Senator MONRONEY. You want it applied clear across the board so that a copilot's rating will have the same meaning as an ATR, as second on command?

Mr. SAYEN. And the type rating, for practical purposes.

Senator MONRONEY. What is the usual time, since we have so many senior pilots here, just relatively, that a copilot actually flies in the course of flying?

Mr. SAYEN. About half the time.

Senator MONRONEY. He makes landings and takeoffs, too.

So most pilots share with him, do they not, and are interested in bringing along his proficiency, because they are good friends and coworkers, is that right?

Mr. SAYEN. Normally, where the copilot is qualified, he flies a leg and the captain flies a leg of the trip, alternating.

Senator MONRONEY. This avoids undue fatigue and makes flying safer?

Mr. SAYEN. It maintains proficiency and so forth. Of course what we are saying here is that the captain can get a trip once in a while

where he has an individual as copilot who has been recently employed and has not been trained to standards, and his third man may be in the same boat. And so we have a situation where you not only have all your normal responsibilities to carry out, but you are doing on-the-job training at the same time. This is not a proper operation. Normally, when a man is qualified they alternate the flying.

Senator MONRONEY. What you want is the man on the other seat, when he steps into the plane, to have the qualifications and all so that there is no doubt, so that you don't have to teach him how to avoid the boners?

Mr. SAYEN. That is right.

In summary, I said at the opening of the statement that we would cover some subjects that would be covered in other aspects of these hearings.

Senator MONRONEY. I think you have handled it very well.

I think you have touched on them without orbiting around them for a long period of time. I think it is very helpful in stimulating the thoughts of the committee and those who are following the hearings, with some of your general approach to this without getting into specifics.

I certainly think you have hit the safety angle very hard and very well. I compliment you on the way the statement has been written.

Mr. SAYEN. Thank you very much.

We would like, therefore, before we leave, to make a number of very specific recommendations.

As stated in the opening, we came to criticize and to talk specific problems. I would then like to make specific recommendations:

1. We have noted with interest other specific recommendations made by the Air Transport Association on pages 17, 18, 19, and 20 of a statement made before this committee by Mr. Tipton. We have examined these recommendations carefully and we endorse them, and some of the following recommendations will be a repetition or a reemphasis of some of them.

2. We believe that a major effort should be made to improve the airport and terminal area facilities of this country without any further delay. This is, in our opinion, an emergency project without which the safety and efficiency of our air transportation system will be very severely handicapped. Without such an accelerated program, the tremendous investment that we are making in air traffic control facilities and new aircraft will be badly handicapped.

Among the projects necessary immediately to move this program are the following:

(*a*) Immediate decisions on standards for approach lighting and runway lighting: We think that the research in these areas has, for all practical purposes, been completed. There have been practical tests under actual flight conditions of the various systems.

We think the users overall—military, civil, and even into the international field—have agreement as to what we need in these fields.

What we need now is installations.

Senator MONRONEY. It was pretty good under the weather conditions yesterday afternoon on the south end of Washington National. We were both on the same plane. This is not a theoretical thing. It is in practice. It has been in use for 2 years. We know pilots praise it.

There have been no bugs found in it. It is relatively inexpensive compared with other electronic devices.

It can be installed probably in 30 days, if any airport has the will and the determination to make their airport safe. Why can't the bottleneck be broken?

Mr. SAYEN. I think there has been progress, in all fairness, and I would like to correct some of the figures given as planning figures this morning, which indicate that the number of centerline approach lights at commercial airports is now down to 105, and high-density discharge lights to 42.

This is a long way from covering the airports in this country. As I said, there are 569 airports just in the United States getting airline service. Of course, on most airports there are only instrument approach facilities on one direction and one runway. If you go to London, Gander, Montreal, other airports, you will find approach light system in four directions, ILS in four directions, approach lights in at least two directions.

To the best of my knowledge we have only two airports in the whole country that have approach lights in more than one direction.

Senator MONRONEY. Which are they?

Mr. SAYEN. Idlewild and Newark, I believe, have approach lights in two directions. The only airports in the country——

Senator MONRONEY. Washington National, which is supposed to be the best moneymaking airport, has them in only one direction?

Mr. SAYEN. That is right. We have only one single selection so long as the full instrument approach capability is concerned.

Senator MONRONEY. Anything technically difficult about making ILS from both ends of the field instead of just one?

Mr. SAYEN. No. I would like to ask Captain Masland to discuss the instrument approach facilities at London Airport, for example.

Mr. MASLAND. London Airport has three pairs of parallel runways. They have instrument approach facilities, full instrument approach facilities, to four of those runways. That includes ILS, centerline lights, compass locators, and so on. They are capable of landing parallel operation at the airport and giving the pilot a full choice of runways. To some degree that is true over the Continent.

I have a list of airports that we frequently use: Amsterdam, Copenhagen, Le Bourget, Orleans, and so on. Those are similarly equipped. The new airports are superb, superbly lighted and provide in most cases a multiple choice of runways.

Senator MONRONEY. With ILS?

Mr. MASLAND. Yes, sir.

Senator MONRONEY. All the needs that the pilots have been talking about for the last 5 years for U.S. airports?

Captain MASLAND. Yes, sir.

Senator MONRONEY. How many do we have?

Mr. SAYEN. Two airports.

Senator MONRONEY. Two airports in two directions, and 42 or 40 with only one?

Mr. SAYEN. According to the figures I got this morning, there are 105 installations or partial installations of approach lights out of 569 airports.

Senator MONRONEY. At this point, since you have such a galaxy of experienced pilots here, the standardization of high-intensity approach lighting would be a factor in adding to air safety, would it not, rather than having to adjust yourselves to many, many kinds of different approach systems? Could someone speak on that?

Mr. HOPKINS. Obviously it would. I thought it reached that standardization, at least what we thought was, the ALP approach light system which we have pushed for years.

Senator MONRONEY. I think you still have to use how many different kinds of systems?

Mr. HOPKINS. There are a number of them.

O'Hare, which is in our second largest city, Chicago, has parallel runways. One of them is very short for jet operations. This is the one we are working our ILS approach on now. For some reason the other is shut down. It does not have standard approach lights. It has a bunch of red lights on the side. Only one runway has crosswind conditions; we are forced under 25-knot crosswinds to land on one runway because there is no runway into the wind. This is in Chicago, the second largest city in the United States.

Senator MONRONEY. A brandnew airport.

Midway has one set of approach lights?

Mr. HOPKINS. That is right.

Senator MONRONEY. That is the busiest airport, or was, until O'Hare.

Mr. HOPKINS. They have some stacks sticking up with red lights, that come under you.

Senator MONRONEY. Water towers are poor for approach lights?

Mr. HOPKINS. Yes, sir.

Senator MONRONEY. Would any of the other pilots care to speak up?

This is a good place to speak up on the miserable approach lighting you find on the airports.

Mr. HOPKINS. Washington National, your back course approach here, the so-called Georgetown approach, is a very, very poor approach. I mean you have the Washington Monument sticking up in your left rib, no ILS, no approach light, as you come in.

When you are landing up the river you have a pretty good system. Any other way you don't have it in Washington.

Mr. SAYEN. If I could say a word in behalf of our local service pilots, we have certificated service to many cities around the country. The facilities with which these pilots are flying are the facilities with which we flew more than 20 years ago. In Williamsport the approach facilities——

Senator MONRONEY. This is where the carrier missed his approach?

Mr. SAYEN. The approach facility there consists of a loop-type range, as I understand it. A loop-type range went out about 20 years ago, as far as any effective navigational facility is concerned. They always waved back and forth every time you had a rain shower or lightning discharge. It has been replaced all around the country, years ago.

This has a loop-type range which is 7 miles from the airport. After the pilot finds this spot somehow he is supposed to find the airport and he has 7 miles to go down the road, I guess.

So far as the runway lighting is concerned, I understand they had a couple of strobe lights out there but they had not hooked them up. I guess some day they will hook them up.

These are a couple of lights at the end of the runway. These are not uncommon, and these are the kind of facilities that people are flying with into these airports.

Senator MONRONEY. These lights that we are talking about, the high-intensity approach lights and all, they are not expensive items, are they? This is probably the least expensive of anything we can do, including putting down more concrete.

Mr. SAYEN. That is right. They have a long life, and they increase the value of the airport a great deal because you can use the airport to lower minimums, and increase the value of the entire navigation facilities for the airport.

We think the standard has been determined. We have thought so for some time. It has been pretty well agreed to as an international standard. We have been concerned because we keep hearing about people who are going to begin to research the approach lighting question.

If this is going to be done, we think this is a very serious mistake. The decision should be made based on research which has been accomplished. Installations of approach lighting and runway lighting were made at military fields. Every conceivable type of aircraft was flown in marginal weather conditions on these. The reports made, they were flown by both military and civil pilots, and reports that were made indicated that this was completely acceptable to both military and civil operations.

Most of the things in common with other countries have been resolved. This should be finalized and we should go ahead with it. If we are going to do more analysis we will get into what General Kildare calls paralysis by analysis.

Mr. SMITH. Mr. Chairman, having appeared before your committee on previous occasions, I feel certain you are familiar with my position on approach lights.

Senator MONRONEY. I believe you are the one who caused us to write in the report on the Airport Act, to get busy and get something done.

Mr. SMITH. In following up what Mr. Sayen has just mentioned, I think it is appropriate to point out that some of the problems we had in finally reaching a criteria for the standardized approach light program are now creeping up on the next stage of the visual aid program as such.

Normally we find out that when the operations people have agreement on a program, then the technical people try to figure out what is wrong with the stuff we feel will do the job.

For example, the program that Mr. Sayen referred to was conducted by the Air Force at Dow Air Force Base in Maine. In reading from their summary of a document which is category 3, test of an integrated visual approach and landing aids system, which was written by Col. Roy L. Strong, of the Air Force, and adopted by Maj.

Gen. W. C. Sweeney, commander, Headquarters, 8th Air Force, they carry this conclusion:

The IVALA system tested represents a major step forward in aviation and in conjunction with existing or planned precision electronic approach and landing aids will meet the essential military requirement for a visual approach and landing aid system which can assure operation of military aircraft under all visibility conditions.

Currently our operating minimums for commercial jet aircraft are higher than our other aircraft because of the size. One of the needed aids to work toward the save-all-weather system is the next program as far visual aids are concerned.

The area of difficulty right now is that at NAFEC, which is the Federal Aviation Agency's test bed, these particular visual aids are presently being implemented.

The problem confronting us is the fact that currently we are prohibited from operating commercial jet aircraft into NAFEC. Therefore we have no way to intelligently evaluate any visual aid program at NAFEC as far as heavy commercial turbojet aircraft are concerned.

I feel quite certain that nobody will disagree with the point that approaching in low weather conditions in a Piper Cub or a twin-engine Cessna cannot be construed as being represented to the problems facing a pilot in a commercial 707 or DC–8.

It is interesting to note——

Senator MONRONEY. That NAFEC is the Atlantic City Research Center; is that correct?

Mr. SMITH. Yes, Senator. That is the Federal Aviation Agency's experimental center.

Senator MONRONEY. Having served on the Appropriations Committee, I know that the field is not heavy enough to take a jet or an Electra. I know it is not heavy enough to take a 707 or a DC–8.

Could you make a simulated landing and pull out and test these out with the heavier type of aircraft, or must we wait until we get the runways beefed up before we ever get to additions on high intensity lighting systems?

Mr. SMITH. For years we have been able to get an airplane down to 200 feet or so, safely. At 200 feet, this is where the problem starts.

To be able to do this consistently in commercial turbo-jet aircraft, we need additional visual aids. And if we do not evaluate these as the Air Force has done, under actual zero-zero where conditions, with every current heavy type jet aircraft, we do not have an intelligent basis on which to come up with a conclusion.

The information has already been determined and it is one of the reasons why we take the position that the research and development has been done. This has already been undertaken at Dow Air Force Base.

We feel quite happy with it because the program, as far as equipment is concerned, is exactly what we have recommended.

Senator MONRONEY. This type equipment I believe, the high intensity approach lighting, has been available since 1951, has it not?

Mr. SMITH. It goes back further than that. The visual aids that I am referring to now concern primarily the manner in which the landing area on the runway is lighted. I don't consider that we really have an approach light problem as concerns a criteria. I

feel we finally have a criteria for it. But now we are getting into the next stage of having an urgent requirement for which the answer has already been determined.

But we have the thing, the problem being processed through research and development, at an airport where we can't evaluate it. Consequently during the meantime nothing happens.

Senator MONRONEY. The point that you are making is that it would be better to take a little of this money that is going into research, put it on a busy airport, try it out and see if it is satisfactory when it gets out into normal commercial or air traffic operations, rather than rely on this testing with lighter aircraft.

Mr. SMITH. The point that I am trying to make, Mr. Chairman, I think goes a little farther than that. The conclusions have already been reached, and they have been reached under actual weather conditions with heavy type jet aircraft similar to what we are operating. The program that was evaluated was primarily a proposal from operations people, which included airline pilots, operations people of the airline, and the military.

In effect the answers are known. All we are waiting for is the establishment of a criteria.

Senator MONRONEY. You may proceed.

Mr. SAYEN. We are saying he doesn't need any more experimental tests. We have actually tested these systems for many years.

Sentor MONRONEY. You would like to turn on the lights now?

Mr. SAYEN. We would like to have some decisions and turn on some more lights.

Senator MONRONEY. So would this committee.

We have been screaming about it for 4 years.

Mr. SMITH. Might I make one more point on this, Mr. Chairman.

The way this thing gets tied up is that as long as there is no criteria for this equipment, we have no guarantee that Federal Airport aid money will be directed to this much-needed safety improvement.

Senator MONRONEY. Do you mean that none of the funds that we have appropriated can be allocated to local airports that are willing to supply the easement or the land with the 100 percent of Federal funds that go out for that?

Mr. SMITH. This system is installed right in the runway, right in the landing area, where an airplane sets down. As long as there is not an acceptance by FAA or approved criteria recognizing the merits of this equipment, we have no guarantee, nor does the airport operator, that Federal aid will be allocated to this type project.

Senator MONRONEY. Isn't this lighting we are talking about now, where the airplane sits down, the same as we have on the south end of the main north-south runway of Washington National?

Mr. SMITH. No, sir.

Mr. SAYEN. He is talking about the second half of it, the runway lighting, right in the runway itself, as you make the transition from the approach lights on to the runway. Unless you have runway lighting you will go right into a black hole after you leave the approach lights. This is the lighting in the runway itself. This is the other half of the system.

Senator MONRONEY. Isn't this what we have, some new fluorescent lighting, that shines across, on Washington National?

Mr. SMITH. This is a form of it. This is not the exact hardware that I have reference to. Our experience has been that the exact hardware at Washington will not give us the same beneficial results as the exact hardware installed in the runway at Dow Air Force Base, and which currently is being installed on the runway at Idlewild.

Senator MONRONEY. That is an exact copy of the Dow Air Force equipment?

Mr. SMITH. Yes, sir. We might point out that this is not a new philosophy. This currently exists in quite a few airports throughout the foreign countries; particularly throughout Holland.

Senator MONRONEY. Thank you very much, Captain.

Mr. SAYEN. I might say that somebody has given me a note which said there were no fatal accidents in 1959 on the approach to any runway fully equipped with ILS and center line approach lights. And if we had had that system at La Guardia we wouldn't have had an accident, which I think this committee has already established.

Senator MONRONEY. We had testimony that had there been adequate lighting, approach lighting, we would probably have been able to forgive all the errors of instrumentation and whatever else had occurred.

You, I think, very helpfully gave us a breakdown as to the areas of accidents on page 5 of your statement; that out of the 16 fatal accidents, 7 were on approaches to airports, 8 were en route, 1 was engine failure on takeoff. If there is a pattern—and we have said that there evidently wasn't a consistent pattern—the seven accidents occurring on the approach to airports would certainly indicate that this is a high degree of exposure at least to being accident-prone in that area.

Mr. SAYEN. I think we go on to the accidents which were very serious accidents which required investigation, to get the 39 accidents, of which 14 of them were in the terminal area.

Senator MONRONEY. I read in the newspaper that at the expense of the airline pilots and in cooperation with some of the airlines, that you have employed safety engineers in this field of study. Would you care to add to your testimony anything that they have been doing or achieving?

Mr. SAYEN. I think the study is in process and we are really not free to comment on it. But it is a study of what is called "Journey's End" which I think is an appropriate title, a worldwide study by the way, of accidents which have been occurring at the journey's end, at the terminal area. There will be a complete analysis to determine the pattern and so forth of these types of accidents. The terminal area accidents are not confined to this country by any means. There is a problem all over the world.

The second recommendation in the terminal area is immediate research and decisions on standards for airport firefighting and rescue equipment. I think this is very, very important.

(*c*) Immediate decisions on standards for airport zoning and clearways along the line recommended by the Doolittle Commission.

Senator MONRONEY. Before you leave the firefighting, is there any foundation or insurance company, as they do in fire prevention work in buildings, working on that to give industry assistance or to develop specialized equipment that might be needed? You mentioned the jet

aircraft with their very thick skins and the inability of normal firefighting equipment to open escape hatches?

Mr. SAYEN. There is a very excellent organization, National Fire Protection Association, which has been working on this problem for some years. It has done some very good work. Some of our people have been working with them.

There has been some work done by ICAO along this line—the International Civil Aviation Organization. We have worked with them on some of this. So there is something to start from.

Of course there has been a tremendous amount of work done in firefighting research and other areas of industry. So there is a great deal to draw from in attacking this problem.

The problem is simply that in this country the problem has not been attacked for aircraft and airports. There are no standards.

Senator MONRONEY. And there is no identification of where this equipment is, as you well pointed out, which I think is a highly significant thing, that it is not going to do any good to have Foamite and everything else on the airport if the pilot doesn't know what they have.

Mr. SAYEN. There are tables which have been put together. We published them for the pilots. There has been a great deal of work done. It needs very badly to be consolidated into a standard of procedures for using it, and putting together by the Federal Aviation Agency; as the agencies do it.

Senator MONRONEY. Your position on this is that it has been so vital to the journey's end part of the matter that you even advocate for the airline pilots that local funds should be matchable, perhaps 50–50, by Federal funds, to see that adequate firefighting installations exist.

Mr. SAYEN. I think the terminal area problem is equally as important a problem as the air traffic control problem. One is completely hitched to the other. The air traffic control system starts at the ramp and ends at the ramp. It doesn't start at the airport and end at the airport. They are all part of one system. They must be tied together as one system. One won't work without the other.

Senator MONRONEY. Let me ask you another question. This committee had some experience last year with cases involving the firehouse, or fire station. In other words the fire equipment was standing at the wrong end of the runway, or in a temporary building 15 or 20 minutes removed from the runway, poorly located. We did, I believe, establish a precedent, after a considerable amount of effort, in getting such buildings identifiable as "airport facilities" that were available for Federal matching money. That is a very important item in this problem of firefighting, the fact that firefighting equipment be located at the point on the airport where it is most apt to be instantly available.

Mr. SAYEN. We are currently in the process of making another study, a survey of both the United States and overseas, of overall airport facilities. This study is again in process at the present time. The last time we made such a study I recall an instance where they found that the local airport used the community firefighting facilities. The only problem was that the airport was fenced and there was no system of getting the equipment through the fence.

We are making another survey at the present time. We will have more information before too long.

Senator MONRONEY. While we are on this, do you recall the case where the 707 had its wheels stuck and had to circle the field while the New York radio and television stations had a field day building up a crowd to see if the plane was going to crash or not? This was a great hazard, was it not, that interfered very drastically and added not only to the danger of the pilot getting the plane down safely, but also exposed to danger the numbers of people who were allowed to crowd onto the field?

Mr. SAYEN. Yes, sir. And had that aircraft run off the runway it probably would have butchered some onlookers. We have to have some very definite systems for keeping these airports clear.

Senator COTTON. As a matter of fact that lesson was learned to some extent, because a similar episode occurred shortly thereafter, where they did a very good job.

Mr. SAYEN. Yes. I think there have been improvements. Captain Smith works that district more than I do.

Senator COTTON. It seemed to me that just within 3 or 4 weeks after that they had a similar situation in which they promptly got everybody out of the way. Isn't that correct?

Mr. SMITH. I think it probably would be appropriate to answer your statement this way, Senator——

Senator COTTON. It wasn't a statement. It was an inquiry. I have a recollection, and I would be glad to have it confirmed or not confirmed.

Mr. SMITH. Probably an easy way to handle it would be to point out that sufficient experience was gained through the Pan American episode to point out that some corrective action was needed. It was taken and the situation now is handled in a routine manner.

Senator COTTON. That is what I understood.

I thank you.

Senator MONRONEY. You may proceed.

Mr. SAYEN. The next recommendation is (*c*) immediate decisions on standards for airport zoning and clearways along the line recommended by the Doolittle Commission.

If you look at photographs at airports taken in consecutive years, you see the continued encroachment on the airport area to the point where, as I mentioned in my statement, the housing is built just a few feet from the end of the active runways. This is not only hazardous, it creates a noise problem and all the other problems that go with it. This problem has been recognized for a long time.

The Doolittle Commission did an excellent job on this problem. This can be controlled by cooperation between the Federal Government and municipalities in their zoning, and it can be controlled by expenditure of Federal funds or nonexpenditure of Federal funds for runways where this is not provided.

We are still having accidents where the aircraft touches down 40 feet short of the runway; the aircraft overruns the runway by 100 or 200 feet, and rather than being a clearway or underrun, we are having disastrous accidents from it.

Of course, the noise problem is another whole story. This is something that is very badly needed at new airports, and has been needed for a long time. It shouldn't be delayed any longer.

Senator SCHOEPPEL. On encroachments of buildings to the airport runways, here is an instance where some of the Federal agencies or departments could cooperate to an extent. A lot of those buildings, new homes, they would not have been built without FHA loans on them. They go up all over the country, even today, and that is a foolish way to protect some phases of the national safety in this regard. That is being done all over the country.

Mr. SAYEN. I agree with you completely. This is going to take cooperation of FAA, the municipalities, the other agencies of the Government. But the job just simply has to be done. Airports today are $100 or $200 million investments.

The whole thing could be lost as a result of a lack of zoning in the airport area.

Senator MONRONEY. Would it not be in keeping with insuring the Government's investment and that of the local community if some section of the FAA, perhaps the airport section, would engage in a mail campaign and perhaps with graphic descriptions—"Protect your investment against strangulation"? I am aware of two or three airports that once had thriving airframe manufacturers on them, like Santa Monica, that today can't build an airplane there because of the encroachment of the communities on the airport.

Consequently, the manufacturers have had to move to Long Beach where they have adequate approach zones and room for expansion.

Mr. SMITH. Mr. Chairman, following up on this point of encroachment, I would like to point out that at Idlewild, which currently has in excess of a hundred jet operations a day and is probably the biggest jet airport in the country, for the next couple of years, in spite of the fact that over $300 million has been invested in this airport, we have available one runway for jet operations. And off the end of this runway right now there are being constructed 4,000 homes. As you probably gather, we have had a rather serious noise problem in the Idlewild area. Obviously, this will not improve it.

Senator MONRONEY. 4,000 homes? Do you know whether FHA or GI qualified?

Mr. SMITH. Yes, sir.

Mr. SAYEN. At Midway Airport, Chicago, in the last year and a half, a whole group of homes was built across the street from the airport fence, and the runways were extended to the airport fence. I would say feet from the runway. I mean literally feet. It is about 100 or 150 feet.

Senator MONRONEY. This is Midway?

Mr. SAYEN. Yes, sir. There are over a thousand aircraft movements a day at Midway. And at one point last summer they reached 1,700 aircraft movements a day off the airport, which all of us thought some years ago would be impossible—1,700 aircraft movements in one day.

Senator MONRONEY. I wish the committee counsel would inquire of the Federal Housing Administration and the Veterans' Administration what justification under the Housing Act for the security of

Government-insured mortgages they consider when they are built adjacent to or in the takeoff zones of airports.

Senator COTTON. Has the FAA or any other agency promulgated or have they indicated they will promulgate any kind of rules to make more difficult the operation of planes because of noise?

Mr. SAYEN. I don't know of any. I understand that the Veterans' Administration has done something about loans, but not the FHA.

Senator COTTON. I am not talking about loans. I am talking about earlier. I am referring to a part of your statement this morning when I thought you very correctly and properly said that you opposed any promulgation of rules in the interests of preventing noise that would curtail or make more difficult the landing and taking off of jet planes. What I want to know is has anyone suggested any of those rules?

Mr. SAYEN. FAA has a proposal under consideration at the present time to establish specific rules for entering and leaving Los Angeles International Airport, which are devoted specifically to the noise problem. In our opinion some of them substantially compromise the ability to operate out of that airport safely.

Senator COTTON. You have mentioned that this noise problem has been with us a long time. But there have been some recent developments that should have some impact on it because now we have these military jet airports, jet airports located in various sections of the country. I know I have one in my own State. Immediately people begin to cry out about the noise problem, and the Air Force always says, I think with a good deal of justification, the defense of the country is more important than the silence around these airports.

If folks can't take a little noise they have to move. I would think the safety of the problem also is more important than the silence around civil airports. Hasn't this problem more or less decreased since the military jet airbases have begun to operate?

Mr. SAYEN. It is a very, very difficult problem still, Senator. It has been a very difficult problem in Idlewild, N.Y., Los Angeles, and a number of other cities where the citizens are not only very irate over the noise nuisance from aircraft, but are now well organized in opposition to any aircraft operation that aggravates this noise.

Senator COTTON. Just one more question. If you can, answer this in terms that will be understood by laymen, if it is possible. How can a jet take off silently, or with less noise? How do you decrease the noise in taking off with a jet?

Mr. SAYEN. There has been a proposal that would, in effect, at the Los Angeles Airport restrict jet operations to one runway at certain times of the day, to one runway in one direction, which means that the pilot must then take off with a downwind component and make other compromises with normal rules of operation that he would use in flying into or out of that airport for the noise problem. We have been very much opposed to adopting these kinds of rules as Federal rules on an airport-by-airport basis without first specifying a minimum level of safety that we are not going to go beyond in compromising with the noise problem, because the citizens who are complaining about the noise may wind up with an airplane in their backyard instead of just noise.

Senator COTTON. One more question. Has the Federal Aviation Agency given any notice that they are seriously considering promulgating that rule?

Mr. SAYEN. Yes. The Administrator proposed such a rule about 2 months ago. The time for comment has elapsed. If the rule is adopted it could come momentarily.

Senator COTTON. A rule affecting one airport?

Mr. SAYEN. Yes.

Senator COTTON. Restricting operations to one runway at certain hours of the day?

Mr. SAYEN. It would have this effect, yes.

Senator MONRONEY. Also it would have the effect of requiring a downwind takeoff of a jet airplane, would it not? Up to how many knots?

Mr. SAYEN. Up to 10 knots, I believe; 9 knots.

Senator MONRONEY. Tell us roughly what is the comparable decrease in the runway length that would have, or in plain understandable language, the fact that a plane would require much more runway to get off the ground safely with a 10-knot tailwind than it would with a wind on the nose and takeoff into the wind.

Mr. HOPKINS. This is being observed to a certain extent by reducing the allowable gross. The operators are taking a terrific penalty in reducing the load they can take out of the airport in meeting that requirement of the downwind component. Do you have the figures on that?

Mr. SMITH. I can give you an example, Senator. On 1 airline, aircraft which carry 20 to 25 people on a long-haul flight, with such a restriction this permits them to carry 36 people. This is from the economic standpoint. There are no provisions in this proposal considering runway conditions as to whether it is dry or wet. The performance data on a 707 or DC–8 in this accelerated stop area which we discussed previously, on wet runways, is not available. I don't think anybody can give us the information. So we are placed in the position of effecting a takeoff without knowing what we are doing, by law.

Senator MONRONEY. Pilots have the right, do they not, if they are assigned a runway for takeoff that they do not feel is safe under the conditions then existing, to decline to use that runway? Is that correct?

Mr. SMITH. We used to have that right. But now if we exercise it we have to write the Administrator within 48 hours to justify our decision.

Mr. SAYEN. That is the proposal.

Mr. SMITH. This is the proposal.

Senator COTTON. I want one thing for the record, Mr. Chairman. I asked you if the proposed rule restricting to certain hours of the day a takeoff at Los Angeles Airport to one certain runway, and your answer was "In effect, yes."

I don't question the accuracy, perhaps of your conclusion. But I would like to have at this point in the record, Mr. Chairman, if possible, what the exact rule is, and then we can study the effect. Could we have it inserted in the record at this point or immediately after the statement, that proposed rule? I would be glad to have you amplify

your answer, because you said, "In effect, yes." I wonder what you mean by "In effect."

Mr. SAYEN. We would be very happy to place in the record the proposed rule, and if we may, put it with our comments on the proposed rule. We would be very happy to enter both of those for you.

The draft release, 59–17, issued October 28, 1959.

Senator COTTON. Does that also give the FAA reasons for suggesting the rule?

Mr. SAYEN. Yes.

Senator COTTON. You will insert it all?

Mr. SAYEN. We will insert the entire draft release and explanation *by the FAA, dated October 28, 1959, and our comment* of December 15, 1959. I am told that the effective runway increase required is 200 feet per knot. *Nine knots would give you at least 1,800 feet.* This is all other things being equal. This is on a dry runway. Of course, it *greatly increases the rolling* speed of the aircraft before it leaves the ground, and a number of other problems.

(NOTE: The above mentioned material was not supplied for the record.)

Mr. SAYEN. There is another factor. When you restrict the use of runways, you restrict the entire planning *for the entire flight, because* this affects your fuel capacity to where under certain conditions you could plan a flight in a certain way which in your best judgment is the proper way to do it for maximum safety, you would now have to make a different plan, and probably have an en route stop to pick *up additional fuel, because of noise consideration.*

Senator MONRONEY. You talked about California. At Idlewild there are certain directions in which you cannot take off with a full load today, also, are there not?

Mr. SAYEN. Under the procedures that have been followed there has been a preferential runway system under which we would—this has *been a voluntary cooperative* effort on the part of the aviation industry which has been very, very effective, by the way—under the preferential *runway system you would use the preferential* runway and reduce noise to the maximum that you could, consistent with other safety *matters.*

Presumably immediately following a rule adopted for Los Angeles, *there would then be a rule adopted for New York,* also, and I presume it would then go to other cities around the country. One of the things that concerns us is that a different set of rules would be adopted for every airport. Some air pilots are qualified into 50 or 60 or more airports. We come up with a very cozy situation as far as being able to get in or out of these airports, in addition to what we think are safety compromises.

Senator MONRONEY. We were talking about takeoffs, downwind takeoffs. Is there not also the same type of regulation, proposed for approaches which the pilots consider dangerous simply because they are chiefly designed to make accommodations for people on the ground? Could you spell that out for the committee?

Mr. SAYEN. Of course all you can really do about the noise, once you have a given powerplant hooked up to a given airport, is to move that noise, either laterally or vertically since the sound diminishes with distance.

The noise regulations usually take the form of trying to maintain as high an altitude as long as possible, and then making a quick descent into the airport so that you aggravate as few people as possible. This has to be controlled, of course, very carefully because if you get too high a rate of descent you will keep right on going when you get down to the ground. You have to do this very, very carefully.

Senator MONRONEY. Do any of our planes use spoilers, as the Caravel does?

Mr. SPENCER. The 707.

Senator MONRONEY. Does it have the same characteristics on the top of the wing?

Mr. SPENCER. It is only used for braking purposes on the ground.

Senator MONRONEY. On the ground?

Mr. SPENCER. Yes.

Senator MONRONEY. The Caravel uses it all the time in regular landings, and it gets good results without picking up speed in descent.

Mr. SPENCER. The spoiler system on the 707 can be used to facilitate the descent, but it is not used for a landing approach because again the steepness of the approach would be such that you wouldn't be able to flare it out. But immediately upon contact with the runway you then raise the spoilers in order to get the maximum effective braking.

Senator MONRONEY. You haven't been told yet to make downwind landings in jets, have you?

Mr. SMITH. No, sir. I know of no downwind landing proposals. Actually in Idlewild the airport operator when he establishes noise abatement procedures never considered the landing problem. So he never had any procedures. The agency that handles the noise abatement procedures in New York has considered both landings and takeoffs, which obviously has to be done when you look at traffic moving in and out of the airport. There is a process of runway selection predicated on the least amount of residential areas around the runways as possible. But at Idlewild we have been severely hampered because the two runways we had, which were fairly sparse from a residential standpoint, are now being rapidly filled up with housing. We just will not be able to use any operational techniques to provide the relief that we could a couple of years ago.

Senator MONRONEY. Will there be any abatement when you retrofit the jets with turbo-fans.

Mr. SAYEN. If you don't add the commensurate amount of weight, you will get a higher rate of climb, and so the noise would be moved vertically more quickly on takeoff. On landing you would have about the same situation, I gather.

Senator MONRONEY. Are there any other questions? If not, you may proceed.

Mr. SAYEN. (d) Immediate steps to certificate airports in line with the report of the Doolittle commission. At the present time, as you know, the airports are generally owned and managed by the municipalities, except for those that are owned and managed by the Federal Government. The municipality fairly well makes its own rules for the airport, except that an airplane operating into and out of the airport must operate in accordance with the Federal regulations. To this extent there are some standards required.

We think that the certification of airports, and we agree with the Doolittle commission in this regard, would enable some establishment of standards for airports which are going to have certain types of operations. If we are going to keep the aircraft airworthy, and the airmen airworthy, and everything else airworthy, you should also keep the airport airworthy. It is an essential part of the airways system.

(e) The immediate installation of known aids to navigation, such as—

(1) The establishment of control zones at all airports which are provided with instrument approach procedures.

(2) The establishment of control towers at all air line airports.

(3) The installation of standard approach lighting on all major instrument runways.

(4) The installation of instrument landing systems on all major instrument runways.

(5) An early decision on standards and installation of visual glide path equipment wherever necessary. This is a new device, not completely new but coming into use more recently, a relatively simple device which is of very great assistance in landing aircraft in more or less standard patterns.

3. Extend the positive separation of aircraft under the air traffic control system to all operations above 10,000 feet as quickly as possible.

Senator MONRONEY. What has prevented that going in? I know your pilots establish the instrument procedures under VFR by your own volition which led to a speedup of this by 1 or 2 years at least, and maybe more, by your bold act when you said this has gone far enough. Is it the lack of implementation of personnel, or the ability of the present equipment to handle a greater number of flight plans so that all aircraft in that airspace will be under instrument control?

Mr. SAYEN. Captain Smith?

Mr. SMITH. Mr. Chairman, this could take quite a while. I think one broad approach to it is the fact that the current air traffic control system, is not really being designed to provide separation to all airplanes in the airspace. When you implement a positive control airspace segment you are denying the right of use to airplanes that are not equipped to operate in there, or denying them the use because of other traffic.

The system does not have the capacity to do this on a wide scale basis right now, nor do the planning and research that is going on contemplate such a capability at a later date. In this respect we go along with the philosophy of taking first things first. If we could just get the effort going in the right direction, on our jet routes, and start bringing this controlled airspace down as rapidly as possible, we would be gaining considerable improvement of protection to the traveling public and also the people on the ground.

We have no indication that this is being contemplated on a wide scale basis. There is a proposal, and it is in the incubator stage right now, to put in a segment of controlled airspace in the eastern part of the country, which will only concern altitudes of 24,000 or probably 29,000 feet, wherein they will try this.

Hopefully this will provide some information to better highlight the exact requirements that the traffic control system should have.

However, I think personally that some of the philosophy has to be changed before we can really start moving with this. No. 1: Somebody with some responsibility is going to have to establish this as a goal and we do not have this established as a goal yet.

Senator MONRONEY. When we speak of 10,000 feet, you are speaking of 10,000 feet above sea level, are you not, and not 10,000 feet above terrain, which does present a conflict of interest on the part of the scheduled airlines and those who must use the airspace?

For instance, over Colorado you may be nearing the airspace for other users 3,000 feet above the terrain, which in such mountainous country might not be visible.

Mr. SMITH. Actually the geography part of it, the 10,000 feet would have a good application east of the Rockies, and across the Rockies it goes on up to about 14,500 feet, and a little bit west for a section it is about 16,500 feet, which is what this would result in.

Senator MONRONEY. You would have to try to provide for roughly 10,000 feet above terrain, would you not? Would that not be the broad goal we are talking about, and you are not endeavoring to crowd general aviation down to too narrow a margin in that? I know there was a complaint several months ago where they attempted to control this airspace and seemingly left nothing for the smaller nonscheduled aircraft to use.

Mr. SMITH. Mr. Chairman, in that respect, I think we could point out that a positive separation program which denies the use of some one else who is capable of using it, I would not consider this as a satisfactory solution. However, the same problem at the higher altitudes which is making this "see and avoid" concept totally unrealistic is now in the process of rapidly lowering to the lower altitudes above the ground.

The short-haul operators are now getting into turbine-engine aircraft, which shortly will be cruising around a couple of thousand feet above the terrain at upwards of 350 miles and hour. I think both the private and the commercial pilot will be just as interested, or they will have a common ground of interest of staying out of each other's hair. So it is not a question of trying to run somebody else out of the atmosphere. We need the protection just as much as the other individuals do.

Senator MONRONEY. Thank you, Captain Smith.

Mr. SAYEN. 4. Expedite the implementation of the standard short-range navigation aids to replace older and less reliable and efficient aids as soon as possible. We discussed that earlier.

5. Improve the measurement of weather in the terminal area in order that the pilot will be in possession of more precise weather data. This is a very important project. We are talking here about the weather measurement in the terminal area. Before the pilot leaves altitude in jet aircraft, or with other aircraft, he should be certain of what his possibilities are of effecting a landing at that airport.

Senator MONRONEY. Is that given instantaneously now, or is it tied to the weather 30 minutes ago or an hour ago?

Mr. SAYEN. It varies widely, airport to airport.

Mr. LUTHER. Your runway visual range is taken continuously through a transmissiometer located at the touchdown point looking forward on the runway.

Senator MONRONEY. That is lateral visibility?

Mr. LUTHER. That is forward visibility that the pilot can expect at touchdown. This is transmitted directly through lease lines up to the tower. So they have a constant reading again on runway visual range at the limited number of airports where this is available.

Senator MONRONEY. What about the ceiling?

Mr. LUTHER. The ceiling periodically is taken. Naturally it is taken once every hour, but special reports are taken quite frequently at these airports. Whenever there is any indication of any change in the weather, they will take a special observation, or they will take it upon request of a pilot. But the most accurate device we have today is this runway visual range.

Senator MONRONEY. That doesn't give you the ceiling. That merely gives you the visual range when it touches down. When the plane breaks out it is pretty important for the pilot to know exactly that if they say it is a 500-foot ceiling, that he is able to see the ground at 500 feet.

Mr. LUTHER. They are working on other projects in this area. The weather observation is oftentimes, most frequently taken at a point other than touchdown point. So whereas you may have an indicated ceiling of 500 feet where the weather observation is taken, you may have entirely different conditions existing at the approach end or the touchdown point of the runway. With the RVR—as a matter of fact, we are able now where we have visual range facilities—we are able to execute an approach, if the runway visual range at Newark, for instance, is reported as 2,000 feet, we may initiate an approach and complete it legally even though the official weather is reported as zero-zero.

Mr. HOPKINS. This is a slant measurement.

Senator MONRONEY. You are an old pilot, Mr. Sayen. What would you estimate the ceiling was yesterday when we came in?

Mr. SAYEN. We are limited, first, because the enforcement division is here. I would say about 300 feet, I guess.

Senator MONRONEY. I called the tower when we got in, and they were still reporting 500 feet. That is the biggest stretched-out 500 I have ever seen. Perhaps, as he said, and I had not thought of this until you mentioned it, it may be at another part of the airport other than touchdown; it might be 500 feet.

Mr. LUTHER. This is particularly true at Washington, where you have fog drifting across the river. At your approach point your weather conditions would be continually different, or very frequently different from those which exist at the point where the weather observation is normally taken. La Guardia would be the same type of phenomena.

Senator MONRONEY. Is this not confusing to the pilots, if they are told that the weather is 500 feet and when they reach for it they find it is 300? It is a little disconcerting, I would think, to have lost 200 feet on that precious space for landing.

Mr. LUTHER. They are working on other developments at Newark right now where they have a device where they can tell you at the

point at which you expect to make contact with the approach lights. They call it "approach light contact height." This, then, the pilot is given, this information, before he commences his approach. And you can feel very reasonably assured that the report will be accurate, that you will make contact with the approach lights, based upon this information which is given to you prior to the time you initiate your approach.

Senator MONRONEY. That is where you are fortunate enough to be over an airport which has approach lights?

Mr. SAYEN. Captain Smith?

Mr. SMITH. Senator, on this particular program, I think it is appropriate to point out what runway visual range measures, and why it is so important to us.

The normal weather report that is given by the Weather Bureau measures a meterological condition that exists at the time. Oftentimes this is done a couple of miles away from where we plan on putting down an airplane. The runway visual range program gives to the pilot an indication of how good he can see. This is what we are interested in.

We don't care whether there is a lot of haze or smoke or something like this over the runway evpressed in a nebulous figure. We are interested in knowing that when we get to X altitude we will have a certain visibility. This is the basic importance of the runway visual range program, and it came about as a result of a combined ATA pilot committee in cooperation with CAA and the Weather Bureau.

It is a great cause of concern to us that in the Weather Bureau budget there are sometimes difficulties in having sufficient funds allocated for the expansion of this program.

This program has been extremely effective by practically eliminating the missed approach at Newark, mainly because we now give the pilot an indication of what he will see, and we are at the state of the art where we can guarantee this.

The records at Newark have been kept for a number of years, initially by the old Air Navigation Development Board, now by the Weather Bureau—shortly, as I understand it, by NAFEC, and the almost total elimination of missed approaches due to inaccurate weather reporting has been overcome. The weakness in the weather reporting, as the Weather Bureau gives it to us, is that it measures a particular weather condition at a remote site located other than where we anticipate putting an airplane, and is merely a prediction.

Senator MONRONEY. Is this the little light that shines up in the sky and draws all the bugs?

Mr. SMITH. That is a ceilometer. At some locations this is at the end of the runway. We have found out that by using the runway visual range and measuring the visibility in the atmosphere, that we can guarantee a ceiling. We know, for example, that if we have 2,000 feet, RVR—which measures the visibility that the human eye can see—totally unrelated to meteorological measurement, we can guarantee the pilot ground contact at approximately 200 feet, give or take 10 or 20 feet.

We have in addition to this another Weather Bureau project which will now indicate to the pilot the altitude at which he will sight the ground. This is referred to as slant range visibility. This is a

measurement that is constantly updated through electronic equipment, and is given to the pilot at the time he passes the outer marker and can be rapidly updated so that if it has a substantial change in a matter of seconds, he would know to abandon the approach. By predicting the altitude that the pilot will sight the ground, and by accurately giving him the visibility that he will have over the end of the runway, we are moving toward a much safer operation.

I believe this to be one of the most important safety factors that has to be expanded at many of our other airports—all our other airports.

Senator MONRONEY. How many places now do you have that equipment?

Mr. SMITH. The actual specific use of RVR, wherein we take maximum advantage of the RVR equipment——

Senator MONRONEY. What do the initials "RVR" stand for?

Mr. SMITH. Runway visual range [continuing] is at Newark, Idlewild, and Washington. I believe it is now also in at Los Angeles. The slant range project is only at Newark.

Senator MONRONEY. One?

Mr. SMITH. Yes, sir.

Senator MONRONEY. This is what the pilot sees because he is not looking straight down?

Mr. SMITH. That is right.

Senator MONRONEY. He is looking through atmospheric conditions which would be less in visual contact than if he were looking straight down through a hole in the bottom of a ship?

Mr. SMITH. Each instrument approach at Newark is monitored on a radar scope when the weather is below 600 feet, and we have an arrangement whereby when the pilot sights the lights he announces "Lights" over the microphone and at the radar shack the electronic people photograph that picture. Then through the process of analyzing their predicted altitude observation and the altitude at which the airplane was when they saw something, they have now concluded that this is an extremely precise state of the art and it has good application.

Senator MONRONEY. You have convinced me of one thing, I am going to take Newark planes when the weather is bad.

Mr. SMITH. I moved to Jersey, and I fly out of Newark only.

Senator MONRONEY. You may go ahead.

Mr. SAYEN. 6. Expedite a program of direct communication between the pilot and air traffic controller and take all possible steps to reduce the cockpit communications workload.

If you have been up front in a fast airplane in recent years, it sounds like having two or three teenage daughters on the telephone, because the pilots are occupied in communications almost constantly and it takes almost full time of one crew member just in communication. Some of this must be automated with some sort of signal system. There are some things being done in this area and they should be expedited in any way possible. Of course, to make direct communications between the project and controller, and cut out the middle man, which is helpful, you need to go beyond this with some automation equipment.

7. Immediately reinstate a positive system of near-miss and incident reporting that will encourage the maximum flow of such information to the Federal Government and aviation organizations. I discussed this fully.

Senator MONRONEY. You consider this as very valuable if we are to note the exposure—other than through tragic accidents—of this close proximity flying of high performance aircraft?

Mr. SAYEN. Yes. This goes beyond near miss. It goes to incidents overall, mechanical malfunction and many other things that come up.

Mr. HOPKINS. There was a recent exchange of correspondence between the association and the FAA relative to this flight following above flight level 24,000 feet. This is the new thing that we are getting into, this question of getting your civil jets up in these altitudes where the military has been the only operator up to this time.

The idea, as I understand it, was that every civil jet would be on an instrument flight plan. It would be tracked on radar, and they would be advised of other traffic. There are deficiencies in this plan. Airplanes are getting through the radar net. The thing that concerns the pilots' group is that we can't get this acknowledged. The reasons these airplanes are getting through the radar net I don't know. There is probably a number of reasons. It is not the civil jets. They know where the civil jets are. They are operating on a flight plan at a fixed altitude with transponders operating.

The military jets are operating up there VFR in large numbers. This is a new environment we are getting into, a new situation in airways traffic control. Military jets presumably are required to have transponders when they are VFR in the vicinity of the civil jet airways.

It is not infrequent, I would say that sometimes it happens as frequently as twice on a trip, sometimes it may be every three or four trips, where you will have a military jet pass in close proximity to the airplane which you are flying.

You will be in contact with the radar man on the ground and you will say: "Did you see this jet airplane," and he will say: "I did not see it."

The man is not asleep. He has been giving the other craft, he is working hard. But there are holes and these are getting through. I don't know whether they have any way of monitoring, whether they have transponders or not. They are not in voice contact with any of the radio stations that are tracking.

Combined with the fact that the near-miss program, the reporting of it, has been destroyed, ineffectively getting a solution to the problem. We can't come out and talk about it, because the problem is if this man you are talking about was on your right instead of your left, it was you fault.

It is a serious thing and you will probably see in the next year or two a collision between a military and a civilian jet.

Senator MONRONEY. You mentioned transponders and that the planes were to have them on and that you don't know whether they have them on or not. It would be a simple matter to require the pilot of one of these planes that is airborne to check his transponders to see if it is picked up by the radar screen, would it not?

Mr. HOPKINS. It would be if he were in contact with the radar station. Maybe they have a way of checking them. On the civil jets we are operating we have two transponders and a throwover switch.

We have no indication that the transponder is operating. However, our flight cannot be dispatched after coming in unless we have enterd in the flight log book that both transponders have been checked on this flight and are operational.

Senator MONRONEY. Who does that?

Mr. HOPKINS. The radar tracking stations that are following you on the ground. These radar tracking stations are split up at present between two principal sources. You have FAA–ATC personnel and military installations, using military radar, and you also have these same personnel in your FAA–ATC centers tracking the thing.

These are the people that advise you whether or not your transponder is operating, when you query them. There is a lot of traffic they see, a tremendous traffic they see, they advise us of all the time, that we never see.

There is some traffic we see that they don't see, and there is some that neither of us sees, and that is the traffic that concerns me.

Senator MONRONEY. I am trying to get it in plain language. It is like headlights on a car. You see through the darkness or through the space of radar, and you pick it up.

You have transponders, so those implement the normal radio radar reflection?

Mr. HOPKINS. Yes, sir.

Senator MONRONEY. That is with a civil aircraft traveling in those areas. Does this constantly reflect or is it on just certain times?

Mr. HOPKINS. We have it on from takeoff to landing, and presumably——

Senator MONRONEY. You have it on or off?

Mr. HOPKINS. On.

Senator MONRONEY. From takeoff to landing?

Mr. HOPKINS. Yes. On the ground it is off.

Senator MONRONEY. From takeoff to landing?

Mr. HOPKINS. Yes.

Senator MONRONEY. It is on constantly in flight?

Mr. HOPKINS. Yes, sir; it is constantly on in flight. Presumably the military jets, when they are operating VFR, or in the vicinity of civil jet airways, are supposed to have theirs operating. Sometimes they are not.

Senator MONRONEY. It is not very expensive to operate them. It is just like leaving your lights on?

Mr. HOPKINS. It is not a question of expense. It is just a question of not knowing that they are operating or forgetting to turn them on, or some undetermined thing, where the radar is not picking up from this other equipment. It happens frequently.

Senator MONRONEY. The radar would be bound to pick up an operating transponder?

Mr. HOPKINS. This is the contention. But they go by. They have not picked them up. All we can assume is that the transponders are not operating. The ground station says we do not see them.

Senator MONRONEY. Are they required by military regulations to be on all planes using that altitude?

Mr. HOPKINS. It is my understanding under the situation I stated, above 24,000 feet when they are VFR in the vicinity of civil jet airways. If they are IFR they are not required to operate them. This is a peculiar rule. You are flying northbound at 24,000 and another

is coming south at 26,000, a military, and he is not required to have his transponder on, presumably because he is IFR at the time and they know where he is. I don't know.

Senator MONRONEY. The expense is not great. You don't wear these out, do you?

Mr. HOPKINS. No, sir.

Senator MONRONEY. You do not have to install one for each flight?

Mr. HOPKINS. It is a problem. And it is complicated by the fact that our liaison has broken down in this area. Anything that is reported as a near-miss is a cause for disciplinary action against the pilots involved. So how can you communicate under this situation? I don't know.

Senator MONRONEY. It is your feeling there are a sufficient number of near misses in this controlled airspace that something should be done so that all planes, military or civil, have transponders working for the duration of the flight at those altitudes?

Mr. HOPKINS. This presumably is a regulation now, that they will have transponders working when they are in this situation. I do not like to call them near misses, but the fact is that you are being tracked by radar and they say you have traffic at 12 o'clock, 20 miles. And you see one go by a mile away that they have not seen. This is not necessarily a near miss but these things close awfully fast up there, the jets. You can see them sometimes. By the time you have registered and can take any evasive action, it is too late.

It is fortunate they are not on a collision course. The "see and be seen" may be obsolete, but "see and do something about it" is not.

Senator MONRONEY. And these transponders are more clearly identifiable on the radar screen.

Mr. HOPKINS. It is a new and helpful program. We have a lot of ATC people riding with us on our flights, and we have talked to them. I think it has a lot of merit. But there are these holes, and there are holes in the so-called passoff.

In other words, when you leave, for example, Memphis ATC area and pass to the Atlanta area, when you contact Atlanta they have you on radar.

When you leave the Washington center area here and you are passed to New York, frequently New York does not have you.

I don't know why, or what the failure is in this area, whether they need more radar or not. They do not have you when you are passed over to them and they will say: "Report over such and such a fix," or they will ask you to make an identifiable turn for identification when you are carrying all sorts of identification in the airplane which only needs to be keyed. I think this is something probably which can be rectified.

The overall problem I think is the breakdown and the liaison. We can't get through, we can't talk about these things because we have this thing that says there will be no near misses.

Senator MONRONEY. No near misses reported so there are no near misses.

Mr. HOPKINS. Right. So I have not had any near misses.

Senator MONRONEY. You may continue.

Mr. SAYEN. No. 8: Initiate immediate rulemaking that will provide the traveling public with a fail-safe flight crew providing the

same protection in the flight crew that is afforded in the other components of the aircraft.

I think we have discussed this rather fully in our statement.

Senator MONRONEY. Yes.

Mr. SAYEN. No. 9: Expedite research in every possible way for an airborne anticollision device that will restore the see-and-be-seen capabilities to the cockpit.

There is no doubt whatsoever that "see and be seen" as a means of separating traffic is an excellent thing if it can be worked. It is a system we use in every means of transportation, almost, and it would be excellent if it could be worked. The Government, of course, in maintaining the airways system, might be saved almost fantastic sums of money if you could restore the "see and be seen" system at least in some measure to the cockpit of the aircraft.

The system of controlling all movement of aircraft from the ground, maintaining separation from the ground, is a very difficult thing. I don't know what we are talking about now in terms of investment in our overall traffic system. But we are probably getting well into billions of dollars before long, with half a billion dollars a year maintenance cost.

Senator MONRONEY. Do you or any of your senior pilots know of any mechanism or device for self-contained instrumentation that would achieve these ends as of now?

Mr. SAYEN. There is some research being done by various groups, but we are not aware of any that we could say would do the job. But there are techniques that have been developed in other industries and so forth that hopefully can be applied.

10. Amend the Federal Aviation Act of 1958 so as to provide that rulemaking actions of the Administrator are subject to review by the Civil Aeronautics Board.

We discussed that quite fully before this committee during the consideration of the Federal Aviation Act, and again in our statement today. I think we have covered it quite adequately. We will return to it again if the committee desires later.

Senator MONRONEY. It will probably come up again during the pilot certification matter, when we may go into it more fully.

Mr. SAYEN. No. 11: Amend the Federal Aviation Act of 1958 so that any doubt is removed that action against a certificate of a carrier or airman is subject to the appeal provisions of the act.

That concludes our statement. We have some attachments which I believe are self-explanatory, which are an analysis of the fatal accidents involving scheduled airlines, domestic and international, during 1959, and then the terminal area accidents which accurred during 1959, and brief analysis of each.

Senator MONRONEY. These are so valuable I would like to have them printed at this point in the record.

You include some accidents of which the committe does not have even a record from previous testimony, including the overseas accidents, which of course since they happened to American aircraft are of vital importance to the question of air safety.

If the other members of the committee are agreeable, I would like to include this entire page, with the description of the summary of the accidents, in the hearings at this point.

(The material referred to follows:)

ATTACHMENT A

Fatal accidents involving scheduled airlines (domestic and international), calendar year 1959

No.	Date	Airline, equipment, and location	Crew killed	Passengers killed	Comments
1	Feb. 3, 1959	AAL, Electra—New York, N.Y.	3	63	Approach.
2	Mar. 30, 1959	RID, C-46—Alma, Ga.	2		Fire en route.
3	May 12, 1959	CAP, Viscount—Chase, Md.	4	27	Weather en route.
4	do.	CAP, Connie—Charleston, W. Va.	1	1	Approach.
5	June 26, 1959	TWA, 1649—Milan, Italy (international).	9	59	Explosion en route.
6	Aug. 15, 1959 [1]	AAL, 707—Calverton, N.Y.	5		Approach.
7	Sept. 2, 1959	AAXICO, C-46—Abilene, Tex.	2		Do.
8	Sept. 12, 1959	PAA, DC-4—Honduras (International).	3		En route.
9	Sept. 29, 1959	Reeve, DC-4—Alaska.	3	14	Do.
10	do.	BNF, Electra—Buffalo, Tex.	7	27	Do.
11	Oct. 19, 1959 [1]	BNF, 707—Arlington, Wash.	4		Do.
12	Oct. 25, 1959	PAC, DC-3—Santa Monica, Calif.	1		Takeoff.
13	Nov. 1, 1959	PAI, DC-3—Charlottesville, Va.	3	23	Approach.
14	Nov. 16, 1959	NAL, DC-7B—Biloxi, Miss.	6	36	En route.
15	Nov. 24, 1959	TWA, 1049H—Chicago, Ill.	3		Approach.
16	Dec. 1, 1959	AAA, M-202—Williamsport, Pa.	4	21	Do.
		Total	60	271	

[1] Training accidents not in CAB records.

Source: From CAB records and ALPA files.

Accidents (1959) fatal and nonfatal—Terminal area accidents

Date	Carrier	Equipment	Location	Number of fatalities	Summary
Jan. 14	EAL	DC-7B	New Orleans, La.	0	Unreported smog during flareout for landing and unsuccessful pullout—substantial damage—fire hazard. Improved approach and runway lighting and weather reporting would have prevented this accident. Airplane came to rest approximately 3,800 feet from threshold and along side of runway.
Jan. 25	EAL	M-404	Plattsburgh, N.Y.	0	Airplane struck unreported snowbank at runway approach end. Snowbank was 3 to 4 feet high, unmarked, and blended into the surrounding terrain. Nose wheels and fuselage damage was moderate. Airplane stopped about 2,000 feet from threshold.
Jan. 27	CAP	Viscount	Lansing, Mich.	0	Airplane struck unreported frozen snowbank at threshold of runway and damaged propellers and landing gear. Airplane slid approximately 1,400 feet before coming to rest on its left wing. Snowbank blended into surrounding terrain. Weather was no factor.
Feb. 3	AAL	Electra	New York	65	Inaccurate altitude and weather information. Lack of landing aids. Airplane contacted water 4,980 feet short of runway threshold.

Accidents (1959) fatal and nonfatal—Terminal area accidents—Continued

Date	Carrier	Equipment	Location	Number of fatalities	Summary
Feb. 5	CAP	Viscount	Chicago, Ill	0	Improper snow removal with no notification to crew. Weather was not a factor. Night VFR. Airplane struck unreported snowdrifts on runway during landing. Damage confined to engines and propellers. Airplane came to a stop approximately 2,300 feet from threshold.
Mar. 15	AAL	CV-240	do	0	Lack of landing aids (approach light and ILS)—night, rain, marginal weather conditions. Airplane contacted ground approximately ¾ mile from runway.
Apr. 9	CAL	Viscount	Houston, Tex	0	Airplane slid off runway while landing under conditions of rain and poor visibility. Inadequate runway markings and other landing aids were apparent.
Apr. 10	PAA	B-377	Juneau, Alaska	0	Aircraft landed short of runway during daylight conditions causing damage to the airframe which resulted in fire which practically consumed the airplane. No fatalities and 1 minor injury. No underrun surface near the approach end of the runway. Airplane touched down approximately 40 feet short of the hard runway surface.
May 12	CAP	Constellation	Charleston, W. Va.	2	Aircraft overran runway end and slid downhill during marginal weather conditions. Lack of landing aids, slick runways, downhill gradient were in evidence.
July 22	EAL	DC-7B	Idlewild	0	Airplane landed approximately 15 feet short of the threshold and left gear struck sharp curb-like edge of runway breaking off left gear. Airplane came to a stop 4,280 feet from approach end of runway. Extensive damage—no injuries—potential fire threat.
Aug. 26	CAP	DC-3	Charleston, W. Va.	0	Aircraft overran runway on a night landing during adverse weather conditions. Slippery blacktop runway.
Nov. 1	PAI	DC-3	Charlottesville, Va.	23	Aids for approach to airport considered marginal.
Nov. 24	TWA	Constellation	Chicago, Ill	12	Following fire warning and feathering engine, airplane returned to airport and during circling approach it crashed approximately 1,000 feet from the runway end.
Dec. 1	AAA	M-202	Williamsport, Pa	25	After first approach airplane circled for a landing and struck hill 1 mile south of the airport. Modern airport approach aids lacking.
			Total	127	

DESCRIPTION OF AIR LINE PILOTS ASSOCIATION AND INTERNATIONAL FEDERATION OF AIR LINE PILOTS ASSOCIATIONS AND PERSONAL BACKGROUND OF CLARENCE N. SAYEN

The Air Line Pilots Association is an association of the professional airline pilots of the scheduled U.S. carriers. At present, it has a membership of over 18,000 active and inactive members employed by 49 certificated airlines.

The association represents airline pilots in all aspects of their professional life. It is their bargaining agent under the Railway Labor Act, maintains an extensive air safety organization in 149 councils scattered throughout the United States, its territories, and a number of foreign countries, and is spokesman for the airline pilot in his relationship with municipal, State, Federal, and international organizations.

The International Federation of Air Line Pilots Associations is a federation of the pilots representing organizations of 33 countries and represents the professional pilots of practically all civil aviation in the world outside the Iron Curtain countries.

By way of personal background, I hold bachelor of arts and master of arts degrees in geography and economics and an honorary doctor of science. I have been a teacher and an airline pilot. Some current activities include membership on the Committee on Aircraft Operating Problems of the National Aeronautics and Space Administration; Executive Committee of the National Air Transport Coordinating Committee; War Air Service Pattern Committee of the Defense Air Transportation Administration; Executive Committee of the Radio Technical Commission for Aeronautics; the Chicago Aero Commission; Industry Advisory Committee of the Interdepartmental Aviation Manpower Committee; and national defense executive reserve.

Mr. SAYEN. What I should make as a point—or the head of our Engineering Department won't let me go home—is the large number of airport accidents reported on this exhibit as a result of something as simple as inadequate snow removal on the airport. You find accident after accident in this summary where—and this goes on year after year after year—that is due simply to inadequate snow removal on the airports. These kinds of accidents, combined with the accident where the aircraft touches down a foot, 10 feet, 15 feet, before the beginning of the runway or runs 50, 100, or 200 feet off the other end of the runway, are very, very serious accidents and they go on year after year.

Senator MONRONEY. And they are very simple of correction if done in time.

Mr. SAYEN. With underrun or overrun areas.

Senator MONRONEY. One thing I note in your summary, and the rest of your statement, you have not mentioned anything having to do with maintenance of aircraft. Do you think that the maintenance is that perfect that there need be no changes or no additional supervision or checkout of men in critical positions at least in aircraft maintenance. Should they be certificated like pilots as to their proficiency at certain times?

Mr. SAYEN. I believe we testified some years ago in opposition to the action to do away with considerable licensing of the maintenance personnel. In other words, a license to the whole shop, rather than licensing the individual, to where the responsibility went to the organization doing the maintenance, rather than the individual and his particular license.

We felt at the time, and we haven't changed our views on the subject, that it is better to have the licensing on an individual basis where the responsibility is firmly fixed.

That situation remains. As far as I know today the shop is licensed rather than the individual mechanic. Frankly, we don't have statistics on how well this is working. We have had maintenance troubles from time to time, as you know. This is a difficult thing for us to document overall. I should say in passing, because I understand it was the subject of considerable discussion before this committee—and this has to do with the stalling problem which came up on——

Senator MONRONEY. Before we get to that—I wish you would testify on that later—on the maintenance end, we have a letter here, a copy of which was sent to me, from a pilot on one of the major airlines saying:

> I would like to make the comparison for you: 20 years ago Eastern Airlines had 12 DC–2's and 8 DC–3's. They had approximately 100 pilots. We all know that these ships were simple in detail and equipment. The Civil Aeronautics Administration had safety agents in proportion to pilots and there were three CAA agent inspectors. Eastern Airlines has now over 2,000 pilots and safety agents in the same proportion as pilots. How many maintenance inspectors do we have? Still 3. We now have 227 complicated electronic monsters. These three maintenance inspectors cannot even keep up with the ship log books—they told me this—let alone do any spot checking.

I wonder if you feel that in the field of maintenance, the maintenance has kept pace with the complexity, numbers, and performance of the new aircraft, or the old aircraft.

Mr. SMITH. Mr. Chairman, I think in the maintenance field obviously we are pretty well exposed to the quality of maintenance that our airplanes receive. We have no way of determining whether the work is adequate or inadequate until you have an opportuinty to fly the airplane. But from a philosophy standpoint one of the big problems is the ability to coordinate all the experience that is gained on aircraft. In this area it would appear appropriate, instead of having an army of inspectors go out and personally check each particular log sheet to determine whether or not there is a maintenance deficiency, it would be more appropriate to require this information to be forwarded into a central location which is properly automated and wherein all this information could be recorded. And as the information comes out of these machines you can then follow up your particular areas, because you will have them highlighted for you.

I am certain that our maintenance experience would greatly improve. As far as the individual qualifications are concerned, I think the European countries are quite a bit ahead of us in this. They require people to be specifically qualified on each particular type of equipment on which they are permitted to work. In England, for example, and Holland, their maintenance people receive the same level of certification of competence as the captain in command does in this country. We cannot operate an aircraft as a pilot in command unless we have been specifically certificated for that particular type aircraft. A mechanic in England cannot work on all propellers, for example, unless he has been specifically trained on each particular model of propeller. We are nowhere near this type of qualification in this country.

Senator MONRONEY. What I was getting at was something along that line, or along better maintenance in checking over the competence as new equipment comes in, that the man will be required, at

least in as sensitive a position in that, to be fully cognizant of all the phases of their work and be checked out by inspectors or company examiners in that phase.

In other words is the mechanic training program sufficient to meet the needs that we face today with the complexity of the aircraft as the operation of the aircraft has upgraded the requirements on the men who fly them?

Mr. SMITH. The airlines have many very thorough training programs that their maintenance personnel have to go through. However, it seems to be an accepted practice in the industry now that when a new airplane is put into service, we go through a normal debugging era in which we get rid of the bugs. The bugs can vary anywhere from a little mosquito to a king sized snake. This is normal accepted practice. People in the airplanes—our philosophy would be, we subscribe to prevention rather than correction.

And where you have the proper quality of individuals, or the proper knowledge of people who are constantly working on these airplanes, who are fully familiar with them, they can render us a big service in eliminating a lot of these bugs before they crop up. And the ability to monitor has been alluded to by the Board in their report of the American Electra in New York where they questioned the monitoring procedures currently in effect on maintaining watch over new equipment that is being put into service.

I think this is a good indication of the fact that there is a deficiency that has to be taken care of.

Senator MONRONEY. Would you think it would help in monitoring commercial aircraft, if in addition to the jets that now require it, we had flight recorders installed on all of them for the purpose not only of determining a cause of crash, but to give a continuing history of rough landings, or ignition trouble, or things of that kind?

Mr. SMITH. I can give you a personal opinion. I am all in favor of them. They have a couple of recorders that can give you very good historical information on your engine performance, your airframe structure. There are a substantial number of pilots who view recorders as being a good piece of documentary evidence in case they may have a little problem at a subsequent date.

There is no doubt that there is good application for that equipment, in my opinion.

Senator MONRONEY. Would that be the consensus of the other senior pilots who are here with you, Mr. Sayen?

Mr. SAYEN. We supported the proposal to put recorders on the airplanes. As I recall when the Civil Aeronautics Board sponsored that proposal, we were the only supporters it had. It was subsequently adopted and put on the jet aircraft. If it is good for jets, I presume it is equally as logical, it is good for other airplanes.

Senator MONRONEY. Not only for accident detection, but also for the continuing monitoring of the difficulties that that particular aircraft might have had during its flight; is that correct?

Mr. SAYEN. Yes, sir.

Senator COTTON. I am curious to know if the Air Line Pilots Association has started to consider in the recent past, or has made any suggestions, or does it have any ideas for dealing with the rather

dreadful bomb possibilities that appear now to be a problem, such as in the recent National Airlines crash?

Mr. SAYEN. We have been concerned for quite a few years not only with the bomb problem, but with the overall problem of what we call dangerous cargo. I asked to come here today the chairman of our Dangerous Cargo Committee because as you know there are many hazards in addition to the bomb situation.

You will recall the case that had a lot of publicity some years ago about carrying live polio virus in breakable crocks, and one of the crocks broke. That happened on Captain Tappe's aircraft, who is here today.

The bomb situation itself, of course, is a most difficult problem because you get down to inspecting people's baggage, and this is almost an impossible thing unless you do it by some electronic or X-ray device, and then you X-ray all sorts of things that are not bombs. This gets very difficult.

I think there is some merit in the proposal that has been discussed having to do with eliminating any possible source of profit from this by outlawing any payment by any insurance company under these circumstances. I realize this is not a complete solution, but most bombing cases——

Senator COTTON. It is difficult to prove the circumstances.

Mr. SAYEN. That's right. But almost all of these cases have been premeditated. They could be at least publicized to get this across.

Senator COTTON. Have you discussed this or made any suggestions to the FAA or any other Government agency in regard to this problem?

Mr. SAYEN. Not with regard to the bomb problem. But we have made many recommendations on the dangerous cargo problem.

Senator COTTON. Have you considered the type of insurance—I don't want to get into a serious situation of threatening somebody's business, but I used to go up and buy an insurance policy at the airport when I flew somewhere, and I found a few years ago that I could take an annual policy with a rather reasonable premium and that avoids all this trouble of running around and trying to fill these forms.

Instead of having the type of insurance facilities so that the person about to climb on a plane could go up and buy a hundred thousand dollars worth of insurance for one trip for a comparatively small amount, if you only had the type of insurance that was carried annually—I believe my policy includes all public carriers, planes, buses, and trains—might that help solve the problem?

I don't want to put you in the position of hurting somebody's business, and if you don't want to answer that I will understand.

Mr. SAYEN. I will be very happy to. The cases so far have generally been premeditated cases where the individual had this plan in his mind for quite a period of time, went out and bought insurance from a normal insurance company and maybe supplemented it at the airport.

We have thought about—this has been a very serious problem with the pilots, and there are many bombs besides the ones that blow up. There are the ones that are threatened to blow up, and the false scares you get months after one of these things happens. We thought if there were some way to disillusion these people that this was actu-

ally a profitable venture; probably if there were Federal legislation in effect that we just don't pay under these types of policies, and then some publicity, maybe jointly by the airlines and the Civil Aeronautics Board, the investigating agency here, to the effect that these accidents are investigated in minute detail and that it is possible to determine from investigation that the aircraft has in fact been bombed, and that the odds against somebody actually collecting insurance under these circumstances would be so tremendous, which it is, that this might disillusion some of these people.

Senator COTTON. Is that true, necessarily? And I don't want by this question to start encouraging some bombers. I have flown from Tokyo to San Francisco on one of these Pan-American Stratocruisers some years ago, a beautiful flight, and to my horror, within a week or 10 days afterward one had completely disappeared. If something like that happens over the ocean it wouldn't be possible in many cases to run this thing down and deprive them of the motive?

Mr. SAYEN. That's right.

Senator COTTON. Is your association now studying that situation?

Mr. SAYEN. We have been studying it for quite a long time. Of course this is a source of very great concern.

Senator MONRONEY. Is there any kind of device, electrical device, which can be used to inspect the baggage to make sure of the contents? I mean laying aside for the moment the loud wails and outcries you might have from the traveling public, is there any such device?

Mr. ADAMS. I don't know if it would be foolproof or not, Senator, but whether or not is was foolproof, if a passenger had to subject his baggage to an inspection of some type, X-ray or some other inspection, it would be a psychological deterrent to him if he were so distraught as to be contemplating suicide on that flight. I think it would prevent that type of thing.

Another thing that is of vital concern is the number of bomb scares that always crop up even after an actual bombing in flight or a bomb scare. It seems to breed on itself. One crank calls up and gets in the paper and another crank sees it. Perhaps these things, the publicity, should be taken away from this type of scare. It only breeds on itself.

Senator COTTON. In other words when you have a bomb scare——

Mr. ADAMS. It brings others.

Senator COTTON. It is pretty difficult, however, to restrain the publicity, isn't it? How would you ever do that?

Mr. ADAMS. By self-discipine of the publicity media.

Senator COTTON. Do you mean the newspapers?

Mr. ADAMS. Newspapers and TV and radio coverage. Because as soon as one starts, it is followed generally by others in the same area.

Senator COTTON. I flew down from Boston last night. I stood in the Logan Airport at Boston at one of the terminals of one of the major airlines that I flew on, and planes were being stacked up a bit because of the overcast. When I saw the crowds of people going through and checking their baggage, I just wondered how in the world you ever would be able to meet the requirements and carry the public even if you had a very brief momentary inspection of peoples' baggage. I think your suggestion about the psychological impact, of having a passenger

walk up and hand his baggage to someone who goes through some kind of an examination, is good. But physically it is almost impossible to handle the numbers traveling now and have that kind of an inspection, isn't it?

Mr. ADAMS. That is true, except if you deprive the passenger of his baggage, and in rush periods you may not be able to examine it all behind the scenes, but he would know what was to be examined. I had two bomb scares within about a week, sometime ago, myself, and it is not pleasant.

In this particular case they were crank calls from one particular town. They call you, and you land and they search your airplane. It is very poor public relations for the airline, and in my own case you never know when one might not be an actual case.

Senator COTTON. In other words, if when you went to check the baggage, and you had a big suitcase that you were going to check, and you had a briefcase that you said you wanted to carry on the plane, and they took both, and automatically they went on one of these conveyors and they went out of sight and you waited until it came back again and you thought it had been inspected, you think that might have a good effect in deterring them?

Mr. ADAMS. Yes, I think it would. It wouldn't be foolproof because you could always have the person who thought he could avoid detection by carrying it on his person in some small device, but at least it is better than the method of detection we have now.

Senator MONRONEY. If you can develop anything that might be helpful, we would appreciate it. This committee is receiving a vast volume of correspondence from many people, inventors and others. Not to be facetious, I would like to read one letter that I received:

DEAR SIR: The airline bombing problem may be solved by placing bloodhounds at the entrance of loading the planes.

The bloodhounds surpass any man-made device of detection, both smell and eye. With the psychology of an ounce of prevention being a pound of cure, no bomber would pass through, with the reputation of the bloodhounds.

Please place in the hands of airlines if the suggestion has any value. A tip would be appreciated.

Seriously, there is some rather important work being done on fluoroscoping or other ways of investigating baggage. At least, the idea that it was being inspected would have a deterrent effect. I have talked to many pilots in flight. They are confident of the weather and their ability to get through, but they are not confident of what somebody might have brought aboard.

We have had only three bombings since the CAA came into effect, two of which, if the latter becomes a bombing, resulted in casualties, the other being a casualty only to the person himself involved; and that out of the half billion passengers moved—I had the ATA put this on an automatic computer—the figures in percentage are 0.000000147.

This is the relative exposure. So if this were the only hazard of air traffic, it would still be the safest method to travel since man began to move.

Senator COTTON. You are referring to known bombings?

Senator MONRONEY. Known bombings.

Senator COTTON. I certainly don't want to cast any suggestion that that isn't so, because we want public confidence, and I am sure we all have great confidence in the safety of air travel. But I am curious about that one accident that I mentioned. I didn't want to give any particular airline attention on that accident over the Pacific, were there ever any conclusions drawn as to what happened to that?

Mr. SAYEN. No definite conclusions.

Senator COTTON. It could have been anything.

Mr. SAYEN. It could have been a number of things.

Senator MONRONEY. You started talking about buffetting and stalling. It would be wise if you have something to add to that. Then I would like to come back to the matter of dangerous cargo.

Mr. SAYEN. I want to clarify in the record somewhat, because it was discussed here, on this question of the stalling of aircraft in pilot proficiency checking, which was a subject of discussion because of action taken by the pilots on National Airlines.

When you stall an aircraft, or get it close to the stall, and contrary to testimony that was given here, the airplane does buffet, and the airplane shakes real good, and sometimes you spring leaks in the fuel tanks, and of course it puts a certain amount of strain on the airplane. Where aircraft are used for proficiency checking they get a great deal of this kind of flying. So normally this work is done by doing approaches to stalls for routine checking. When the pilot first qualifies on the aircraft he will of course do all types of stalls so that he knows thoroughly the flight characteristics of the aircraft. But for routine periodic checking this is not necessary, and so you do approaches to stalls.

In this case this was being carried beyond this point over the objections of not only the operating people of the company but the local pilot group. The local pilot group insisted that this problem be clarified before any further checking of this type was done, and this was stopped until the system of operating the aircraft for these checks was worked out which was satisfactory to everyone concerned, at which time the pilots of National Airlines returned to that method of checking.

This, very precisely, is the story. I wanted to set the record straight on this because I understand it was a subject of discussion.

Senator MONRONEY. Amplifying that now, I believe that General Quesada testified that their examination went only to an approach to stall; that they did not authorize any stall.

What I am trying to get at is this: Are these inspectors going beyond that? General Quesada said, that they never went into a stall; that they only approached the stall, to see if the pilot was able to detect the approaching stall and to be able to correct the attitude of the plane?

Mr. SAYEN. Captain Rohan is here from the airline in question. He also flew the flight test under which the new agreed process was worked out.

Senator MONRONEY. This came about, I think, to identify it, some time in December, before this accident occurred. It was not immediately connected with postguessing on the accident, but was an earlier complaint.

Mr. ROHAN. That is absolutely correct, Senator. The first complaint made to the local FAA office was made by the chief pilot's office of the company on December 8, which was prior to this accident. He felt, and his check pilots felt, that the FAA was pushing these maneuvers beyond the point that it was necessary.

By that I mean this: Under the proficiency checks, it is only required that a man do approaches to stalls. However, due to, in some cases, improper rigging of the aircraft, and the technique of some pilots, the aircraft in doing approaches to stalls was winding up in unusual maneuvers.

Also, the FAA does not require on profficiency checks unusual atttudes. However, these were being required by the FAA inspectors on this increased enforcement program that was going on.

As far as the check pilots were concerned, and the pilots were concerned, unusual attitudes are just as bad as stalls or approaches to stalls.

Senator COTTON. Excuse me. Would you tell us what you mean by an "unusual attitude"?

Mr. ROHAN. Unusual attitudes are generally given when a man goes up for his ATR or first learns to fly an aircraft or instruments. Under these conditions the airplane is put into a maneuver by the check pilots or instructor in question, where he may take the airplane and put it up in a steep dive or put it in a very severe bank, or pull it straight up and release it, and then the pilot takes over and completes the maneuver. We feel that those two are uncalled for on proficiency checks where the man has been flying the aircraft for some time.

After this accident, at Wilmington, we again learned that these maneuvers were going to this point, and the chief pilot's office contacted the FAA and they were told that these maneuvers were being required by the Washington and Fort Worth offices.

I was in turn contacted and I in turn assembled the master executive council of the airline and we took this action through telegram. We felt that it had gone beyond the scope where we could do anything more about it. We did refuse to take the instrument checks. There was a period of some 4 days when no instrument checks were taken.

After a series of meetings—we did not meet locally with the FAA, but the company did—we met with the company and it was determined that we would try to work out some maneuvers in flight which would accomplish the regulations but would not put the aircraft into these severe maneuvers.

I personally flew those and we did arrive at a series of maneuvers which we felt were satisfactory to the aircraft. I also was the first one to return and take an instrument check.

The FAA did not accompany us on these maneuvers. However, they were invited, but they did not see fit to go along.

Senator COTTON. Your rather drastic action was predicated at least in part——

Mr. ROHAN. I beg your pardon?

Senator COTTON. I say, your rather drastic action was predicated at least in part on your sincere belief at that time, of course, that this particular accident had been caused by the weakened structure?

Mr. ROHAN. I wouldn't go that far. I think our action was to this point: We felt that until such time as we knew what caused these accidents, that we should take any step that we could to stop any kind of maneuver that would in any way weaken the airframe of the aircraft.

Senator COTTON. Your action in deciding not to submit to checks was after that accident?

Mr. ROHAN. That is right, the following day.

Senator MONRONEY. General Quesada, in his testimony here, said, in answer to a question by Senator Smathers:

> I want to say categorically, sir, that we have never required any airline pilot, National Airlines or elsewhere, to cause an airplane to buffet as a demonstration of his ability to determine stall.
>
> We do require them to fly the airplane to a speed slow enough to determine stall.
>
> I also want to say to the committee in as clear terms as I know how to use, that if a pilot in the process of determining stall or demonstrate his ability to determine stall, is such a bad pilot that he goes through stall and goes to buffet, he is disqualified. If a pilot causes his airplane to buffet in the process of determining his ability to establish stall, he is certainly a disqualified pilot, because he is unable to recognize the very essence of pilot skill; I don't know of a single case where this has happened. They are better than this.

The question I have to ask is this: Is there a peculiar condition on the DC–6B that causes it to buffet as you approach stall?

Mr. ROHAN. No, not necessarily. I don't think that statement is quite correct, however, that the general made. I don't know of any case where he washed out a pilot for not recognizing approaches to stalls. I might say that the ability——

Senator MONRONEY. To buffet is what he said.

Mr. ROHAN. What we describe as approach to a stall is a buffet. I might say that that depends on a number of things. One is the pilot who is involved, his ability to recognize it, also the rigging and condition of the airplane, and quite a few other things.

I personally know, and I have statements to the effect, that some of these airplanes were subjected to maneuvers in stall configurations that were full stalls, and the pilots were not eliminated from the check ride.

Mr. SAYEN. May I say on the technical point involved, that one of the requirements in the certification of an aircraft itself, as I recall it, is that the aircraft must buffet before it stalls, or it must have a stick-shaker installed. One or the other, or you cannot use that airplane in commercial air transportation. This is how you know it is about to stall, when it buffets. This is your warning of an approaching stall.

Senator MONRONEY. Of course, all planes going through certification have to go through the whole business. You have to completely stall them.

Mr. ROHAN. But the aircraft doesn't buffet. I can also buffet on the other side of the stall. But it buffets before it gets to the stall itself.

Senator MONRONEY. General Quesada also testified, and I understand that you have some statements to the contrary:

> I am informed by the company that this airplane had not been used for test purposes for the previous 6 months, and they hadn't gone through their records

beyond 6 months. The accuracy of this would have to be confirmed by the company.

As I understand it, you have some information that this particular plane had been through some tests and checks within the more recent time?

Mr. ROHAN. Yes, sir. It had been flown on proficiency checks on three occasions during the past 3 months, and the last occasion it was flown on proficiency checks was on January 4, 1960.

Senator MONRONEY. Do you have any idea from information compiled as to what maneuvers it went through?

Mr. ROHAN. I have a statement from the check pilot who was on the aircraft.

Senator MONRONEY. Would you care to read that, or give us a summary of it?

Senator SCHOEPPEL. Mr. Chairman, while the gentleman is getting the data to answer the question, might I say this: The only access I have had to this statement is when we came into the hearing this morning. I have a number of questions that I would like to ask with reference to it, and I would like permission of the Chair and the other members of the committee to submit those questions—on the basis of the record and testimony—to Mr. Sayen, and then——

Senator MONRONEY. I will be glad to yield immediately.

Senator SCHOEPPEL. It is 5 o'clock. Unfortunately I can't stay though I would be happy to. I would be glad to submit the questions and have the answers, when you get them back, inserted in the record.

Senator MONRONEY. I apologize. I didn't know the Senator had a question to ask, or I certainly would have yielded long ago.

He will submit them and you can supply the answers for the record. (See questions and answers printed at close of this testimony on pp. 446 to 452.)

Senator COTTON. Mr. Chairman, while we are waiting, I would like to say, and this probably should be said in executive session, and this is not in any sense a reflection on the present witness—I know that it is impossible to do what you yourself suggested in the Reorganization Act in which you played such a big part, to get statements in here for us to study ahead of time, and I know that in many cases that would be a hardship on witnesses, and in some cases it would lead to disclosing their statements ahead of time and getting them hashed and rehashed perhaps in the press. But when you have statements, as we have, not just this one but others that run into 35 or 40 pages, I pick up the record after the hearing is over and read some of my questions and I find that I have asked questions that I never would have asked if I had had an opportunity to study the thing a little bit in advance.

I wish we could hit a happy medium somewhere so that members of the committee could get a little time to look at these statements ahead of time.

Senator MONRONEY. I think the Senator's suggestion is well taken.

You may proceed.

Mr. SAYEN. The check pilot statement is to the effect that there had been some disagreement. The check pilot objected to the manner in which these particular maneuvers were being performed.

Senator MONRONEY. What were the maneuvers? Is there any description?

Mr. SAYEN. The approach to the stall, the manner in which it was being carried, and so forth, at the insistence of this particular FAA representative.

Senator MONRONEY. At that time you had come to no resolution in your dispute with FAA, is that correct, on the stall procedures and other maneuvers?

Mr. SAYEN. No. This was then being discussed.

Senator MONRONEY. Then it was still in the discussion stage. The date of the letter that you have is what?

Mr. SAYEN. January 8.

Senator MONRONEY. The letter is dated January 8. That preceded the crash of this plane, did it not?

Mr. SAYEN. No; 2 days after.

You have contant problems in aviation with metal fatigue and leaking wings, and all sorts of problems, which are things you are always looking for. You are always looking for this airplane beginning at a certain number of flying hours, after a certain amount of vibration, beginning to develop some characteristics which could eventually result in a spar cracking or a gear mounting cracking and so on.

You are very cognizant of these things always in the aviation business. From my experience in the business it is that it is not at all unusual for the pilots to become upset about something that might aggravate that kind of a situation in the airplane.

We have had these problems before, and we will undoubtedly have them again, especially with the high frequencies we are getting in modern aircraft engines, which do aggravate these kinds of problems.

Senator MONRONEY. Was the FAA inspector riding in this plane the day that it had these maneuvers, or was this duty delegated to the check pilot under definite instructions of what to do?

Mr. ROHAN. The FAA inspector was on board. This was the period of the increased checking by the FAA. In fact during that period they had to ride on every check.

Senator MONRONEY. They rode all check rides?

Mr. ROHAN. Yes, sir.

Mr. SAYEN. Both the FAA and the check pilots.

Senator MONRONEY. All of this occurred with the FAA, not only as to this last flight that you just mentioned, but as to previous flights, which stirred up the December matter?

Mr. ROHAN. Yes, sir. I would like to say here that I do not intend to in any way direct this toward this one airplane. This problem was existing with a number of our airplanes and had been brought to their attention on a number of different airplanes. It was not specifically directed toward this airplane.

Senator MONRONEY. Do you have any further questions on this?

Senator COTTON. No, Mr. Chairman.

Senator MONRONEY. You started on the subject of dangerous cargo. I wonder what you would care to tell us on that. I understand this has been a confidential report which you have taken up with the airlines and with the FAA and CAB, and that it has been subject to study, and that some corrections have been made. Is there anything that you would care to add to this committee's knowledge of that at this time?

Mr. SAYEN. Generally the problem currently is that there is not adequate provision within the regulations for the packaging, handling, processing, shipping of various types of aircargo.

The aircargo business has grown rapidly in recent years. Many of the aircargo regulations are merely regulations which have been adopted from some other industry and are not necessarily adapted to air transportation.

Things have happened which have concerned us, and consequently we have set up an overall project to try to bring this into proper focus.

We haven't made too much progress yet, partly because the problem seems to be getting much the same treatment as the airport firefighting and rescue problem. Everybody recognizes that this is a very serious problem, and that something should be done about it, but things just don't seem to get done.

There are many things shipped by air which have potential danger. We are concerned about, for example, transporting criminals by air. Then you have the transfer of biological products, and so forth. Some of these things can be dropped into the post office airmail and wind up on an airplane with very little if any inspection of any kind.

This is the whole area. We have made some reports on these. We would be glad to submit them to you.

Captain Tappe would like to say a few words on this.

Senator MONRONEY. We would be glad to hear Captain Tappe.

Mr. TAPPE. I am Edward Tappe. I am first pilot for Capital Airlines. I thought, Mr. Chairman, that your comments at the close of the discussion before we discussed the matter of the stalls, was particularly appropriate so far as our concern about bombs placed aboard aircraft, where we have had a half billion passengers who have flown and can pinpoint perhaps only three bombs deliberately placed aboard an aircraft.

The record, of course, disturbs us, if anyone is killed. But by and large the basic concern of our committee is not the bomb placed aboard an aircraft by an individual but the responsible passengers who carry their own bombs, unwittingly, aboard aircraft.

I am talking about such things as flammables, matches, even hair sprays in charged containers that are flammable, rubbing alcohol, nail polish. All of these things constitute a definite hazard. These things are prohibited by law from being carried aboard the aircraft. The passenger may determine the regulations if he refers to J. P. Walker agent's tariff No. 43 on file with the Civil Aeronautics Board. This is a lengthy document.

The ticket that the passenger has, that you had, Mr. Chairman, when we came down from Chicago yesterday, contains a provision that the ticket is sold subject to the regulations of the tariff.

Technically you are obliged to know the tariff. From a practical standpoint I dare say not one person in a million who flies has read the tariff and we would have difficulty locating a copy of the tariff.

So the provisions in the tariff are legal provisions that perhaps satisfy the lawyers from a safety standpoint, but from a safety standpoint do nothing.

Why are these things particularly a hazard when carried aboard an aircraft?

People carry them in their cars, on buses, on trains, and what not. One reason is because of the pressure differential. Even in a pressurized aircraft there is a differential between the pressure inside and outside. So that when the aircraft is taken aloft the air pressure inside the container forces the contents of these materials outside. This is a common occurrence. This is the common occurence of the fountain pen that we all know about, when we find the fountain pen has leaked when flying a lot. These flammable vapors are forced outside. When I was director of passenger relations for TWA, I paid many claims for passengers who complained because the contents of their baggage was destroyed, their dresses were ruined and what-not, because of the things that they had carried which came outside of the containers and nobody had told them about them and they had a legitimate claim.

The hazard arises then where these flammables, flammable liquids, flammable vapors, can in some manner cause a fire or an explosion.

On certain aircraft, under certain circumstances, such things as inverters, used to convert direct current to alternating current for certain instruments; radio equipment; even such things as exposed light bulbs, potentially can cause a fire by igniting such vapors.

I have something very apropos there. On March 30, 1959, the Civil Aeronautics Board released a report on an accident that occurred to an aircraft of Riddle Airlines. This aircraft was set on fire in the air and crashed with a loss of life of those on board and destruction of the aircraft.

The Board stated, and I quote:

> The Board believes that this fire was started by ignition of combustible cargo in the aft lower cargo compartment through contact with an unguarded light bulb. It is believed the fire then reached the compartment wall and damaged a hydraulic unit or line in the wing center section area in the rear spar, igniting the flammable hydraulic fluid in this particular case.
>
> As a result of this accident the company installed guards on all cargo compartment lights on DC–46 aircraft and in addition fire protection and fire extinguisher protection on these cargo compartments was installed by the airline on other DC–46's.

Gentlemen, this action was taken 30 years after this aircraft started service. The plane was that old.

And today we still have in commercial aircraft such potential hazards where flammables, potentially flammable articles, may be ignited.

To get some idea of this problem, if you consider that in an ordinary paint can or can that is taken aloft to an altitude of 9,000 feet, the internal pressures on the lid of that can are somewhere in the neighborhood of 40 pounds.

So you can see what will happen in containers that are not designed to withstand such pressures.

We go from there then to—incidentally, I might say that when we came upon this problem our committee asked Mr. Sayen if we could approach the ATA and the CAA and the CAB to endeavor to find some meeting of the minds to alleviate the problem that we considered to exist before the report itself was formally adopted by the Board of Directors.

He concurred with me. So that before our report was submitted we did approach the ATA and the CAA and the CAB and requested

a meeting which we had. We pointed out to them that this particular problem the foreign airlines are acquainted with and have taken some steps to endeavor to at least advise passengers of the hazards involved here, so that when they buy a ticket they have a leaflet inserted in the ticket, and there are placards on ticket counters.

We determined that the military services had long since appreciated this problem and had set up a procedure whereby all passengers boarding MATS aircraft were specifically advised of these hazards and were given a list of those things which they could not take abroad their aircraft.

To date we have been unable—and I am not unduly critical of any of these people; first things come first as Mr. Sayen said, and I suppose cargo matters have a rather low priority here—in all events the matter has been in the mill for 3 years, and I am hopeful that before 3 more years pass we will do something about this situation.

Senator COTTON. Pardon me, have you with you a list of the articles that you have suggested ought to be promulgated to the traveling public, of things that ought not to be carried?

Have you a list with you?

Mr. TAPPE. I don't have here.

Senator COTTON. Would you insert such a list in the record? It is one means of publicity. I would be interested in reading it.

Mr. TAPPE. I can get it from the tariff and provide it for the record.

Senator COTTON. Undoubtedly some of the staff of the committee could do it.

Mr. TAPPE. It is in the published tariff.

Senator MONRONEY. I think it is a very good suggestion.

If it comes from a responsible source, from airwise people, as the pilot association is, to say that your captain asks you not to bring these aboard your plane, and give that a bit of publicity as you go along, a great many people would observe it.

Senator COTTON. Does that include shaving lotion, witch hazel, or these foam shaving creams?

Mr. TAPPE. Not except so far as their flammability is concerned. But these are potential bombs. They can conceivably, if there is enough internal pressure, explode. Whether under those circumstances they would constitute a hazard I would not say.

We have proposed, and I don't say our committee has a pat answer, we have proposed that a committee of experts study those articles that normally are carried aboard by passengers, and a determination made as to the hazards involved.

Senator MONRONEY. I think you could probably get some help from those insurance companies that carry the casualty insurance on aircraft to assist in some way by publicizing it. I don't know what you can take on a plane and what you cannot. I may be a law violator every time I leave a package of matches in my coat or trousers as I put them in my bag and hand it over the airline counter.

I know MATS asks you—or used to ask you—not to pack any matches in your clothing, that it was prohibited, and it was the No. 1 prohibition during wartime.

Mr. TAPPE. Striking matches anywhere is prohibited on commercial airlines.

Senator MONRONEY. Safety matches are not?

Mr. TAPPE. That is correct. They had been for a period of time, but are not now. We go from this, then, the matter of the passenger's baggage, to the matter of cargo shipped for airlines. We have air-freight and we have air express and we have air parcel post.

In this area civil air regulations sets out the regulations governing transportation of cargo and outlines the cargo which may be carried without restriction and cargo which may be carried under certain packaging and labeling requirements, and there are certain types of cargo that are forbidden to be carried under any circumstances.

Other types of cargo may be carried on a cargo aircraft but may not be carried on a passenger aircraft.

In that regard, basically, the regulations of the Interstate Commerce Commission are utilized. Part 49 was amended on June 25, 1958. Up to that time the CAR 49 outlined in detail many specific commodities that could not be carried or could be carried only under certain circumstances.

As a result of the development of new products, or where it was determined that perhaps a specific commodity had been forbidden but could be carried safely in the opinion of the experts, it was apparent then that part 49 was not current.

As a result, in the change that was made effective January 25, the CAB saw fit to keep the tariff current by placing an even greater reliance on the ICC regulations.

For instance, anything that may be carried by railway express under the ICC regulations, may be carried in a cargo aircraft. The class C explosives as defined in ICC regulations—they are not all explosives but come under that heading of course—if they are packed and labeled and the quantity limitations are within the prescribed limits, they may be carried aboard passenger aircraft.

The CAB outlines the reliance placed on the recommendations of the Bureau of Explosives of the Association of American Railroads, headed by Mr. Harry Campbell. The CAB does not have laboratory facilities of its own and relies largely on the recommendations of the bureau, which for many, many years, as you know, has advised the ICC.

The recommendations, the adoption of the recommendations of the bureau of explosives to cover standards for transportation in commercial aviation, in the opinion of our committee, do not come quite up to the safety standards that we would like.

Although the CAB places reliance on the bureau of explosives in talking with Mr. Campbell about the matter——

Senator MONRONEY. May I say, as soon as this quorum call and subsequent vote is over, you should condense as much as possible because we would like to terminate this part of the hearings. I do not believe it would be profitable to come back after the rollcall.

You may continue, but if you could brief it more, anticipating that maybe we will have a rollcall in about 10 minutes, we will appreciate it.

Mr. TAPPE. Yes, sir. As briefly, then, as I can:

The reliance is basically placed on the recommendation of the bureau of explosives, but the bureau of explosives does not acknowledge that they consider the hazards associated with the transportation of cargo by air in their recommendations to the ICC. Mr. Campbell is con-

cerned about the inland waterways, railroads, buses, and about the motor transport because the ICC governs those media of transportation. So, although we use his recommendations for air, Mr. Campbell does not take air transportation into consideration in making his recommendations.

I would like to read two pages from our report and this will be the end of my comments at this time, Mr. Chairman, if you wish. This was just indicative of the hazards that we think exist.

Senator MONRONEY. That may be submitted for the committee's files.

Senator MONRONEY. I am sorry, but this is a vote and I must go.

Do you have anything to add?

Mr. SAYEN. Mr. Chairman, I would like to express the very great appreciation of myself and all my associates for this opportunity to appear before you and present this testimony.

Senator MONRONEY. Thank you very much.

The committee will stand in recess. We will be in executive session tomorrow afternoon for the uncompleted accident reports. We will meet probably the following afternoon for further evidence.

My thanks to you, Mr. Sayen, and your senior pilots.

(Whereupon, at 5:35 p.m., the subcommittee was adjourned, to reconvene in executive session, Wednesday, January 20, 1960, and resume hearings on Thursday, January 21, 1960.)

JANUARY 20, 1960.

MR. CLARENCE N. SAYEN,
President, Air Line Pilots Association, Care of Mr. Robert Murphy, Senate Committee on Interstate and Foreign Commerce, Washington, D.C.

DEAR SIR: In accordance with the permission granted yesterday by Chairman A. S. Monroney of our Aviation Subcommittee, and your own gracious acquiescence therein, I am submitting the following questions on your testimony with the request that you file your written answers thereto for inclusion in the transcript of yesterday's hearing:

1. Please describe the procedures by which policy is formulated in your organization with respect to comments on proposed FAA regulations or public announcements relating to FAA activities. What provisions in the structure of your organization make sure that policy truly derives from the members rather than from an officer group alone?

2. Are there any ways in which your association disciplines members? For what reasons? Do these include violation of air safety?

3. Does your association provide legal representation for its members in air safety enforcement cases? Is such representation volunteered where the member does not ask for it? What is the extent of the legal service provided? Is there a charge for it to the member?

4. How are members chosen for the Air Safety Committees of your various councils? How are regional safety chairmen chosen?

5. At page 20 of your statement, you say: "But when desk-bound personnel attempt to set up a rigid pattern and division of duties for the operation of aircraft under all circumstances and the anticipation of all emergencies, we are flirting with death." Please give a couple of examples in support of this generality.

6. In amplification of your discussion of enforcement (starting on p. 22), please give a couple of examples of regulations whose literal enforcement encroaches on the area where pilot judgment should rule.

7. Is it the position of your association that violation of a safety regulation should be followed by a penalty only if someone is hurt?

8. Please give a couple of examples of enforcement action by FAA that has been unfair to individual pilots.

9. Mr. Quesada testified that you had not responded to his invitation to submit to him instances of harassment of pilots by FAA inspectors or enforcement officials. Please comment.

10. On page 24, you suggest that the FAA too widely publicizes its enforcement actions. Doesn't your association maintain a busy publicity shop of its own; and haven't you answered every FAA press release that you regard as unfriendly with one or more of your own?

11. The tone of your statement to this subcommittee has been temperate and constructive, but the impression I have gained from reading newspapers is that your association frequently nags the FAA in public and seeks to picture it as tyrannical and unfair. May I have your comment?

12. On page 33, you mention that one who successfully appeals to the CAB can nevertheless lose his case by a subsequent change in the regulation. Will you give an example where the public interest has been injured by such a revision? or any kind of example you want to give.

13. On page 34, in discussing the age-60 rule, you say, "The Administrator freely admits in the notice adopting the rule that there is no evidence on which to base the rule." Please quote the language which you interpret to have this meaning. (I shall then want printed in the record the full text of the notice adopting the rule.)

14. At page 35, you mention a detailed study that your organization has made of pilot incapacitation. Please tell how the study was conducted and specify how you elicited information about heart attacks and strokes.

I am sorry that this list of questions has turned out to be so lengthy, but I think the questions and your answers to them will helpfully amplify our record.

Sincerely,

ANDREW F. SCHOEPPEL,
U.S. Senator.

AIR LINE PILOTS ASSOCIATION,
Chicago, Ill., February 8, 1960.

Hon. ANDREW F. SCHOEPPEL,
U.S. Senator, Washington, D.C.

DEAR SENATOR SCHOEPPEL: In accordance with the commitment made in our appearance before your committee, we herewith submit asnwers to the specific questions posed in your correspondence of January 20, 1960. Following are the questions in the order given in your correspodence together with our response:

1. Question. Please describe the procedures by which policy is formulated in your organization with respect to comments on proposed FAA regulations or public announcements relating to FAA activities. What provisions in the structure of your organization make sure that policy truly derives from the members rather than from an officer group alone?

Answer. The general structure of our air safety organization was presented during the course of our testimony before your subcommittee on January 18. In view of the various subjects presented at that time, it was necessary to somewhat limit information with respect to this subject.

Since you are apparently quite interested in the matter, we are attaching to this correspondence a copy of a pamphlet prepared for our membership which describes in complete detail the organizational structure and procedural steps utilized in processing our air safety problems. Generally speaking, when a problem arises which requires policy decision, a statement of that problem is forwarded to each individual air safety chairman throughout the organization. The safety chairman then reviews the matter with the membership at his particular domicile and farwards their collective opinions, together with their decision on the matter, to our air safety and engineering department in Chicago. These comments, and votes if necessary, are then tabulated and the majority viewpoint becomes the policy by which the officers of the association are guided with respect to the item under consideration. Further, should the item be of sufficient importance, it is referred to our biennial convention for consideration and vote on the subject.

It is believed that the Federal Aviation Agency and industry groups are completely familiar with this procedure as the association quite frequently requires more time than other groups in which to formulate its position in the democratic manner described in the aforegoing.

2. Question. Are there any ways in which your association disciplines members? For what reasons? Do these include violations of air safety?

Answer. The association has available within its organizational structure, both formally and informally, methods of disciplining its membership. Should the question at issue be of sufficient importance, quasi-judicial processes are employed which provide for testimony before hearing boards and appeals therefrom to an additional final appeal board. Such processes can be utilized for numerous reasons, including actions contrary to the best interests of the association and its membership. Continued disregard of air safety rules could very easily lead to severe discipline through these processes. However, as a matter of practical application, air safety matters are ordinarily resolved through more informal processes and processed by the members of the professional standards committees which are established at the various councils throughout the organization. These committees have the jurisdiction and authority to deal with any pilot on their respective air line who for any reason does not measure up to his obligations as a pilot member of the group.

Ordinarily, the problems described in your correspondence would result in the individual pilot being called before his professional standards committee for a complete discussion of the matter. In practically all cases, since air safety matters are readily understandable, an admonishment by the committee to correct his actions or be disciplined results in an appropriate solution. In the event the pilot does not correct his actions, it is then possible to process the matter through the more formal procedures described above. In such cases, the maximum penalty would be expulsion from the association. We have had cases where a member has been expelled but this is rare in view of the fact that the professional standards committee approach is very effective.

3. Question. Does your association provide legal representation for its members in air safety enforcement cases? Is such representation volunteered where the member does not ask for it? What is the extent of the legal service provided? Is there a charge for it to the member?

Answer. When an association member is charged with a violation of the civil air regulations by the Administrator, he is provided representation in the event that he desires such action. Such representation is regarded as one of the benefits of membership and no specific charge is assessed the member. Our membership is quite well informed concerning their rights in this area and, consequently, it is not necessary to volunteer representation for a specific case. The provision of representation does not require a decision by the association as to the rightness of the individual's action except in a case involving consumption of alcoholic beverages in violation of association policies in which cases representation is denied.

4. Question. How are members chosen for the air safety committees of your various Councils? How are regional safety chairmen chosen?

Answer. Our air safety committees are elected by the duly eelcted local executive councils of the areas in which they reside. The regional air safety chairmen are appointed by the president of the association and in his absence by the head of our engineering and air safety department. Central air safety chairmen are elected by the master executive council of the airline. As a matter of practicality, the individuals appointed normally are those who have had a certain amount of experience with air safety maters as a result of their selection by their local councils for work on air safety committees. Reference to the statement before your committee will provide further information on this.

5. Question. At page 20 of your statement, you say: "But when deckbound personnel attempt to set up a rigid pattern and division of duties for the operation of aircraft under all circumstances and the anticipation of all emergencies, we are flirting with death." Please give a couple of examples in support of this generality.

Answer. Generally speaking, the foregoing statement is appreciated and understood by all operational people in the airline industry. As a matter of fact, throughout flight manuals prepared by both management and personnel, references are found which state clearly that the contents of the manuals cannot be considered as substitutes for good judgment in the operation of an aircraft. It is not possible to provide rules which can be rigidly applied to the varying circumstances which arise in the day-to-day operation of an airline. Frequently, the pilot must determine the safest course of action in view of the conditions and circumstances surrounding the problem.

As an example, failure to abort a takeoff after an engine failure prior to the establishment of V_1 speed (critical engine failure speed) resulted in grounding of the pilot by an inspector. However, such speeds are established under stand-

ard conditions and circumstances such as a slippery runway surface, crosswinds, or other conditions, might dictate a continuance of takeoff as the safest course of action. The use of judgment in this area is particularly important in the operation of our jet aircraft. Similarly, good judgment might dictate an aborted takeoff in the event of failure after V_1 speed. A long dry runway with obstructions near the end, combined with a difficult vibration problem, would dictate a decision to stop the aircraft on the runway.

The literal interpretation of the regulation would require action according to the rule rather than good judgment. Further, it is our view that unrealistic enforcement of such rules places a psychological restriction on the use of such discretion to the detriment of air safety. The interpretation of a rule that would require an individual to stay strapped to his seat for 8, 12, or 14 hours continuously, obviously violates all sensible health habits and commonsense.

Following an air traffic control "instruction," from a ground controller, which would cause a pilot to enter a known thunderstorm of extreme turbulence is illogical.

Overall, I believe if you will review the regulations of the FAA you will find almost everything regulated in great detail and, in addition, there are such catchall phrases as "careless and reckless operation" which permit ground personnel to second-guess decisions of pilots on practically any matter included in detailed aircraft manuals, operation manuals, etc.

6. Question. In amplification of your discussion of enforcement (starting on p. 22), please give a couple of examples of regulations whose literal enforcement encroaches on the area where pilot judgment should rule.

Answer. Recently, the Administrator has interpreted CAR 40.354 "Flight Crew Members at Controls" to require that pilots shall remain at the controls during the entire flight. It is obvious that the pilot cannot live within the regulation as interpreted by the Administrator. Flights in excess of 8 hours are quite frequent and we seriously doubt that any human being can abide by the Administrator's viewpoint. To do so would establish a physical condition detrimental to safe and efficient operation. Pilots have been charged with violation of this regulation in instances where they have left the cockpit only for the purpose of physical relief. While we do not disagree that crew members must pay strict attention to their responsibilities, it is believed that some judgment must be left to the pilot in this regard.

In other areas, the enforcement program produced an effect which is contrary to the stated language of the regulation. Civil Air Regulation 40.363 requires the pilot to land at the first suitable airport in point of time after losing the use of one engine. A pilot is required to exercise his judgment as to the suitability of the airport at which he determines to land however distant it may be.

We have described the takeoff situation in answer to the preceding question.

Another area of concern is illustrated by the radar advisory service for specified jet routes promulgated by the Administrator. Under these rules, positive separation service for jet aircraft at high altitudes over designated routes is provided. After describing the separation service, the advisory ends with the following admonition: "These services do not relieve the pilots of their responsibility to see and avoid other aircraft." All segments of the industry, including the Administrator, agree that it is a physical impossibility for pilots in jet aircraft to see and avoid each other with the high rates of speed involved. While the aforegoing may be appropriate from a legal standpoint, it certainly violates the ordinary cannotation of good judgment.

7. Question. It is the position of your association that violation of a safety regulation should be followed by a penalty only if someone is hurt?

Answer. Of course not. This point was made very clear in our testimony and I do not understand the reason for the question. The association, however, draws a distinction between violations which are a result of a combination of circumstances which lead a pilot into an unintentional error and those which may be construed to be the result of inattention or negligence. Further, air safety transgressions normally lend themselves to corrective action rather than punitive judgment. It is this factor which causes the association to feel quite strongly that such matters can ordinarily be resolved by the safety agents in the field, who are familiar with the problems, than by strict legal interpretation by people with no operational experience.

8. Question. Please give a couple of examples of enforcement action by FAA that has been unfair to individual pilots.

Answer. Numerous instances in the past have occurred where personnel of the Federal Aviation Agency stands by and permits the pilot to accept a considerable

penalty from his company in a circumstance in which a probable civil air regulation violation is involved. It has occurred that the FAA personnel have encouraged this procedure, going so far as to suggest to the company what a proper penalty should be. After the penalty is imposed and accepted by the pilot—all with the knowledge of the FAA—the pilot is then formally charged with a violation by the Agency and additional penalties are sought.

There has now been an extension of the FAA Enforcement Division's operation in this area. Recently a captain was reduced to copilot for 90 days because of his purported violation of a civil air regulation. In consequence, he suffered a pay loss of approximately $1,500. After the penalty of suspension had been served, the FAA filed a formal charge of violation against the pilot and asked suspension of his ATR "retroactively" to run concurrently with the company's penalty. We regard this activity of the Administrator as being eminently unfair. It cannot be justified as a contribution to safety, nor can it be said to serve the public interest. Admittedly this activity of the FAA Enforcement Division is only for the aggrandizement of the department.

In addition to the aforegoing, reference to our previous testimony before your committee will illustrate an example wherein the pilot of a 707 aircraft was removed from schedule by the Federal Aviation Agency in an unwarranted manner. It might be well to point out, however, that in this and similar cases, while the problem was resolved and the individual returned to schedule, the amount of flying time lost while the situation is reviewed results in a monetary loss to the pilot in spite of the fact that the eventual decision was in his favor.

The pilot of a Pan American flight was fined $1,000 and publicly humiliated in the Nation's press for being away from the controls. We covered this in our testimony.

Another pilot has been accused officially and throughout the Nation in the public press of refusing to permit an FAA representative in the cockpit. The fact is that the FAA representative refused to properly identify himself and the pilot would have been in violation of the regulations to permit him to occupy the cockpit. Further, the Administrator has widely publicized his accusation and the case is not decided.

In recent widely publicized interviews, the Administrator has accused two dead pilots involved in two separate accidents of failing to follow prescribed procedures despite the fact that the investigations have not been completed and no such evidence exists.

9. Question. Mr. Quesada testified that you had not responded to his invitation to submit to him instances of harassment of pilots of FAA inspectors or enforcement officials. Please comment.

Answer. We are sure you can appreciate the fact that their are numerous channels and well-established procedures, both within the association and the Federal Aviation Agency, for the processing of such matters. Our information with respect to enforcement action is usually obtained from the individual pilot at approximately the same time as the formal note is delivered by the legal members of the Administrator's staff. Quite appropriately, our response is directed to the enforcement official and in accordance with the legal procedures established for such matters. Consequently, this information is available to Mr. Quesada through his own appropriate enforcement officials. Either he is unaware of the activities of his Agency or he is evading the facts in an effort to cloud the real issues. We simply do not believe that the Administrator is serious about removing the enforcement procedures from their normal channels to his personal office.

10. Question. On page 24, you suggest that the FAA too widely publicizes its enforcement actions. Doesn't your Association maintain a busy publicity shop of its own, and haven't you answered every FAA press release that you regard as unfriendly with one or more of your own?

Answer. The Air Line Pilots Association maintains a Public Relations Department. We employ two staff members and two secretaries. One staff member works solely on our internal publications; only our director of public relations is engaged in external public relations matters.

With few exceptions, we have answered most of the Agency's press releases which we considered unfriendly or as an unwarranted or unjustified attack upon airline pilots, or an undermining of their prestige or profession in the public eye. We have no intention of permitting the professional airline pilots of this country, who have contributed so much to the growth and success of air transportation and its fine safety record, to be characterized to the public as irresponsible children.

In our opinion, this is an unfortunate situation but one of the Administrator's own making. We would prefer to spend our public relations funds and time to accelerate constructive progress rather than to defend ourselves from the Administrator's periodic public censure. Further, we have always believed that a part of our responsibility was to point out air safety problems and we think that a review of the record will establish the fact that many such matters have been resolved to the benefit of the public.

Further, we believe that no air safety purpose is being served by the present publicity efforts of the Federal Aviation Agency. We think it worthy of comment that one man and one secretary can gain enough respect by the public press that you as a reader would be impressed by our busy public relations program. We sincerely hope that constructive air safety results will emerge from our efforts.

11. Question. The tone of your statement to this subcommittee has been temperate and constructive, but the impression I have gained from reading newspapers is that your association frequently nags the FAA in public and seeks to picture it as tyrannical and unfair. May I have your comment?

Answer. It has been the historic function of this association to constructively point out areas of air safety deficiencies in order that remedial action might be taken. Our principal force for air safety is the ability to shed expert opinion on air safety problems through what we refer to as the operational viewpoint. We have continued to do this under the Federal Aviation Agency as under predecessor agencies. In many instances, we have publicly supported the Administrator in rulemaking which we felt would improve air safety.

It has been our experience that the press occasionally highlights the more controversial elements that exist and possibly, in this respect, the perspective of some of our statements may have been distorted. However, many of the recent statements of the Administrator have encouraged this type of news coverage.

We do feel that many actions of the Agency have been tyrannical and unfair even though we strongly supported its creation in the passage of the Federal Aviation Act of 1958. However, during the congressional deliberations of this act, we strongly pointed out that failure to include provisions for appeal from the decisions of the Administrator invited arbitrary actions which were inimical to our ordinary procedures inherent in our system of government. Our criticisms have been confined solely to those instances in which the Agency has, in our opinion, indulged in action which can be thus defined. Further, this position is supported at the present time by a great number of experienced aviation people. Hopefully, the Congress will give this matter serious consideration in the interest of amending the law to provide for appropriate review of the Administrator's actions.

12. Question. At page 33 you mention that one who successfully appeals to the CAB can nevertheless lose his case by a subsequent change in the regulation. Will you give an example where the public interest has been injured by such a revision, or any kind of example you want to give.

Answer. There are cases on record of pilots whose certificates have been suspended or revoked for reasons which were at the time subject to review by the Civil Aeronautics Board under section 609 of the Federal Aviation Act. While such cases were pending before the Civil Aeronautics Board, the Administrator has summarily amended the civil air regulations so as to require a decision by the Civil Aeronautics Board adverse to the pilot.

One such incident occurred in the case of a pilot whose first-class medical certificate was revoked by the Administrator for certain medical reasons. The pilot claimed that the condition of his health did not preclude his right to a first-class medical certificate and he appealed to the Civil Aeronautics Board as was his right under section 609 of the Federal Aviation Act. While his case was pending, and before the evidentiary hearing could be concluded, the Administrator summarily and effectively amended part 29 of the civil air regulations by issuing his official interpretation of such part. This amendment wholly disqualified the pilot and made it mandatory that the Civil Aeronautics Board so find, nothwithstanding any evidence which the pilot might produce in his behalf to the contrary.

And, of course, if you will review our testimony on the adoption of the age 60 rule, you will see that it is directed toward the carriers rather than the pilot in a deliberate attempt to circumvent the appeal provisions of the Federal Aviation Act, in which, in our view, Congress clearly intended to preserve such right of appeal.

13. Question. On page 34, in discussing the age 60 rule, you say, "The Administrator freely admits in the notice adopting the rule that there is no evidence on which to base the rule." Please quote the language which you interpret to have this meaning. (I shall then want printed in the record the full text of the notice adopting the rule.)

Answer. The language in the release by the Administrator which "freely admits there is no evidence to sustain the rule" is as follows:

"Such incapacity, due primarily to heart attacks and strokes, cannot be predicted accurately as to any specific individual on the basis of presently available scientific tests and criteria. On the contrary, the evidences of the aging process are so varied in different individuals that it is not possible to determine accurately with respect to any individual whether the presence or absence of any specific defect in itself either led to or precluded a sudden incapacitating attack. Any attempt to be selective in predicting which individuals are likely to suffer an incapacitating attack would be futile under the circumstances and would not be medically sound.

Since you intend to incorporate the release adopting the rule, it is suggested that you also incorporate the press release which accompanied it and discusses the lack of evidence.

Recent releases of the FAA also indicate that they now intend to begin a study of pilot aging. We believe it reasonable to assume that such a study should have been completed before an arbitrary rule was adopted which is precedent setting for Congress and all agencies of the Federal Government.

14. Question. At page 35 you mention a detailed study that your organization has made of pilot incapacitation. Please tell how the study was conducted and specify how you elicited information about heart attacks and strokes.

Answer. The association did in fact conduct a detailed study of pilot incapacitation matters. Much thought and care was given to the preparation of the questionnaire which was mailed to our active membership. Further, the results, together with the questionnaire and procedures which had been utilized, were submitted to the Department of Psychology, Purdue University, for review and comment. The verbatim reply from Dr. N. C. Kephart of that department is as follows:

"In my opinion this is a very well done study. It, of course, suffers from the problems of questionnaire studies; however, such a research is accepted in the literature and these people have a cleaner study than most. The distribution of answers to the question indicates that the forms were filled out conscientiously and that the sample is probably not biased. I think the conclusions which they've drawn are substantiated. Their analysis is OK and I do not think their results will be questioned any more than any study is. On the whole, it looks like a very good job."

As a complete reply to your questions in this regard, we are attaching a report of our physical standards committee to the association's board of directors meeting. Incorporated in this report, as an appendix thereto, is a complete description of the incapacitation study which was conducted, including a sample copy of the questionnaire, as well as a detailed analysis of the responses received. Unfortunately, information with respect to heart attacks and strokes is rather incomplete as individuals with such problems have ordinarily terminated their airline piloting careers and were thereby removed from our membership roles, consequently, valid data was not available.

As indicated during our appearance before your committee, we are very pleased to have this opportunity to provide additional specific information on air safety matters. We trust that you will find the foregoing information helpful to you in your deliberations and wish to assure you of our continued interest in assisting wherever possible.

With best regards, I am,

Sincerely yours,

CLARENCE N. SAYEN, *President.*

APPENDIX I

U. S. CIVIL AERONAUTICS BOARD

BOOK NO. 1

EXHIBIT MATERIAL

SENATE HEARING, JANUARY 11, 1960
AVIATION SUBCOMMITTEE
COMMITTEE ON INTERSTATE & FOREIGN COMMERCE

BOOK NO. 1 INDEX

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A

CIVIL AERONAUTICS BOARD

BUREAU OF SAFETY

POSITION STATUS REPORT - 12/31/59

OFFICE	NUMBER OF POSITIONS: TECHNICAL OR PROFESSIONAL	ADMINISTRATIVE OR STENOGRAPHIC	TOTAL
SUMMARY			
TOTAL DEPARTMENTAL	46	37	83
TOTAL FIELD	32	12	44
TOTAL BUREAU	78	49	127
DEPARTMENTAL			
OFFICE OF DIRECTOR	3	11	14
ENGINEERING DIVISION	15	3	18
OPERATIONS DIVISION	8	2	10
SAFETY ANALYSIS DIVISION	8	14	22
SAFETY INVEST. DIV.			
OFFICE OF CHIEF	2	1	3
HEARING & REPORTS SECTION	8	4	12
FIELD INVESTIGATION SECTION	2	2	4
TOTAL DEPARTMENTAL	46	37	83

BUREAU OF SAFETY

POSITION STATUS REPORT - 12/31/59 (Cont'd)

OFFICE	NUMBER OF POSITIONS		
	TECHNICAL OR PROFESSIONAL	ADMINISTRATIVE OR STENOGRAPHIC	TOTAL
FIELD OFFICES (INVEST.)			
NEW YORK	6	2	8
MIAMI	4	1	5
CHICAGO	4	1	5
KANSAS CITY	3	1	4
LOS ANGELES	4	2	6
FT. WORTH	3	1	4
DENVER	2	1	3
OAKLAND	2	1	3
SEATTLE	2	1	3
ANCHORAGE	2	1	3
TOTAL FIELD	32	12	44

B

ORGANIZATION STRUCTURE AND DIVISIONAL FUNCTIONS OF
THE BUREAU OF SAFETY
CIVIL AERONAUTICS BOARD

ORGANIZATIONAL STRUCTURE The Bureau of Safety consists of:

Office of the Director.

Safety Investigation Division

A. Field Investigation Section

B. Hearing and Reports Section

Operations Division

Engineering Division

Safety Analysis Division

FUNCTIONS. The Bureau of Safety is the staff arm of the Board with respect to aircraft accident investigation and reporting functions including determination of probable cause, set forth in Title VII of the Federal Aviation Act of 1958, and participation in proceedings conducted by the Administrator, Federal Aviation Agency, under Title VI of the Act.

OFFICE OF THE DIRECTOR The Office of the Director is responsible for:

The investigation of facts, conditions and circumstances surrounding aircraft accidents, their probable cause, the analysis and evaluation of information obtained and the preparation of accident reports for Board issuance.

The preparation of comments and recommendations, for transmission to the Administrator, Federal Aviation Agency, suggesting corrective action to improve safety in air commerce.

The preparation of comments and recommendations, for transmission to the Administrator, FAA, concerning proposed safety rules and standards.

Coordinating and directing the technical and administrative aspects of the Bureau's functions, and establishing basic policies and procedures for accident investigation and all other safety activities.

Initiating new or revised Safety Investigation Regulations.

Convening public inquiries to ascertain the cause of aircraft accidents when deemed necessary in public interest, designating the presiding officer and technical members of the Board of Inquiry, and ordering the taking of depositions.

Recommending the convening of Special Boards of Inquiry in particular cases.

Consulting with and advising the Board Members on technical and safety matters, including matters in connection with the implementation of decisions of the International Civil Aviation Organization, and representing the Board on government, industry or public committees concerned with air safety.

SAFETY INVESTIGATION DIVISION The Safety Investigation Division is responsible for the coordination of all phases of accident investigation from the beginning of a field investigation through the preparation of the draft of the accident investigation report. It recommends to the Director that he order a public inquiry when required in the investigation of an aircraft accident, and is responsible for conducting such an inquiry. This Division also proposes, to the Director, the submission of recommendations to the FAA for corrective action to prevent the recurrence of accidents and promote safety in air commerce, and is responsible for keeping The Director currently advised of significant facts concerning aircraft accidents and for advising him of possible violations of Part 320 of the Board's Safety Investigation Regulations concerning the reporting of missing aircraft or of aircraft accidents.

The Field Investigation Section includes a Washington staff and field offices located throughout the United States. It is responsible for:

A. Investigating aircraft accidents, aeronautical hazards and safety incidents, coordinating and directing the activities of the accident investigation teams, consisting of specialists from the Bureau, FAA, and the operator and/or the manufacturer of the airframe, engine, propellers and/or accessories.

B. Participating in aircraft accident investigations by testifying and questioning witnesses.

The Hearing and Reports Section is responsible for:

A. Conducting aircraft accident investigation inquiries, the taking of depositions, including making arrangements for space and other facilities issuing public notices, administering oaths, issuing subpenas, introducing evidence and providing the presiding officer.

B. Preparing and submitting to the Director accident investigation reports.

OPERATIONS DIVISION The Operations Division is responsible for providing specialist staff services in the area of aircraft operations (including transport, commercial, business, private or other types of aircraft), including meteorological factors, air traffic control procedures and airman characteristics. Within this area of specialization, the Division:

Participates in special safety studies and investigations of accidents, aeronautical hazards and safety incidents.

Participates in public inquiries by testifying and questioning witnesses, serves on Boards of Inquiry when designated.

Proposes to the Director the submission of recommendations for corrective actions to be forwarded to FAA and comments and recommendations on safety rules and standards proposed by FAA.

ENGINEERING DIVISION The Engineering Division is responsible for providing specialist staff service in the area of aircraft design and manufacture, including airframe, powerplants, propellers, instruments, systems (hydraulic, electrical, etc.) radio and other electronic aids to navigation and traffic control. Within this area of specialization, the Division performs the functions listed above.

SAFETY ANALYSIS DIVISION The Safety Analysis Division is responsible for:

Establishing and maintaining systems for the accumulation of basic air safety statistics.

Compiling safety statistics, analyzing them to determine causal factors and to identify potential aeronautical hazards and making recomendations for corrective action.

Making special statistical studies concerning safety in aviation and preparing safety bulletins for public distribution.

Establishing and maintaining a control index on sources of information related to air safety for use in accident investigation and promotion of safety in air commerce.

C

CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY

ANALYSIS OF TIME REQUIRED FOR
INVESTIGATION OF
AIRCRAFT ACCIDENTS

AIRCRAFT	AVERAGE MAN HOURS PER INVESTIGATION
Air Carrier - Turbine Engine Type	2154
Air Carrier - Piston Engine Type	647
Air Carrier - All Accidents	1106
General Aviation over 12,500 Pounds	241
General Aviation 12,500 Pounds and Less (Fatal)	45
Rotorcraft	92

Civil Aeronautics Board
January 9, 1960

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CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY
INVESTIGATION DIVISION

ANALYSIS OF TIME REQUIRED FOR
INVESTIGATION OF
MAJOR AIRCRAFT ACCIDENTS

AIRCRAFT	AVERAGE MAN HOURS - FIELD INVESTIGATORS
Air Carrier - Jet Engine	387
Air Carrier - Piston Engine	248
Air Carrier - Jet and Piston	317
General Aviation over 12,500 Pounds	150
General Aviation 12,500 Pounds and Less (Fatal)	42
Rotorcraft	92

Civil Aeronautics Board
December 31, 1959

CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY
ENGINEERING DIVISION

ANALYSIS OF TIME REQUIRED FOR
INVESTIGATION OF
AIRCRAFT ACCIDENTS
1959

AIRCRAFT	AVERAGE MAN HOURS - PER INVESTIGATION
Air Carrier - Turbine Engine	1363
Air Carrier - Piston Engine	247
Air Carrier - Combined	509
General Aviation over 12,500 Pounds	75
General Aviation 12,500 Pounds and Less (Fatal)	2
Rotorcraft	-

Civil Aeronautics Board
January 9, 1960

CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY
OPERATIONS DIVISION

ANALYSIS OF TIME REQUIRED FOR
INVESTIGATION OF
AIRCRAFT ACCIDENTS

1959

AIRCRAFT	AVERAGE MAN HOURS - PER INVESTIGATION
Air Carrier - Turbine Engine	404
Air Carrier - Piston Engine	152
Air Carrier - Combined	280
General Aviation over 12,500 Pounds	16
General Aviation 12,500 Pounds and Less (Fatal)	1
Rotorcraft	-

Civil Aeronautics Board
January 9, 1960

D

CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY

SUMMARY OF OVERTIME
AIRCRAFT ACCIDENT INVESTIGATION
JANUARY - NOVEMBER 1959

MONTH	NUMBER OF INVESTI-GATORS	OVERTIME HOURS			
		WORK	TRAVEL	TOTAL	AVERAGE PER INVESTIGATOR
JANUARY	39	329	251	580	14.9
FEBRUARY	40	1205	431	1636	40.9
MARCH	41	757	378	1135	27.7
APRIL	41	489	328	817	19.9
MAY	43	806	776	1582	36.8
JUNE	42	498	477	975	23.2
JULY	44	779	402	1181	26.8
AUGUST	44	950	383	1333	30.3
SEPTEMBER	43	826	553	1379	32.1
OCTOBER	43	1436	490	1926	44.8
NOVEMBER	48	1367	620	1987	41.4
TOTAL		9442	5089	14,531	
AVERAGE PER MONTH	42.5	858.4	462.6	1321.0	31.1

Civil Aeronautics Board
January 9, 1960

CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY
INVESTIGATION DIVISION

SUMMARY OF OVERTIME
JANUARY - NOVEMBER 1959

MONTH	NUMBER OF INVESTI-GATORS	OVERTIME HOURS			
		WORK	TRAVEL	TOTAL	AVERAGE PER INVESTIGATOR
JANUARY	20	251.9	200.1	452.0	22.5
FEBRUARY	21	712.0	326.5	1,038.5	49.4
MARCH	22	497.6	273.8	771.4	35.1
APRIL	22	341.5	230.2	571.7	25.9
MAY	24	657.6	408.8	1,066.4	44.4
JUNE	23	397.4	296.1	693.5	30.1
JULY	23	415.0	356.3	771.3	33.5
AUGUST	23	770.9	306.5	1,077.4	46.8
SEPTEMBER	22	615.0	401.5	1,016.5	46.2
OCTOBER	22	755.5	368.0	1,123.5	51.1
NOVEMBER	27	919.0	447.5	1,366.5	50.6
TOTAL		6,333.4	3,615.3	9,948.7	39.6

Civil Aeronautics Board
December 30, 1959

CIVIL AERONAUTICS BOARD
Bureau of Safety

Engineering Division

Summary of Overtime
January 1, 1959 - November 30, 1959

Month	Number of Investigators	Overtime Hours			Average per Investigator
		Work	Travel	Total	
January	12	73	45	118	9.80
February	12	457	84	541	45.10
March	12	219	89	308	25.70
April	12	110	78	188	15.75
May	12	123	103	226	18.83
June	12	86	70	156	13.00
July	13	309	41	350	27.00
August	13	166	67	233	18.00
September	13	137	58	195	15.00
October	13	505	164	669	51.46
November	13	280	128	408	31.38
	Total	2465	927	3392	

Average time to investigate General Aviation accidents: 105 man hours
Average time to investigate Air Carrier accidents: 509 man hours

Average time to investigate Air Carrier Reciprocating Engine accidents: 247 man hours
Average time to investigate Air Carrier Turbine Engine accidents: 1363 man hours

CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY
OPERATIONS DIVISION

SUMMARY OF OVERTIME
JANUARY - NOVEMBER 1959

MONTH	NUMBER OF INVESTI-GATORS	OVERTIME HOURS			
		WORK	TRAVEL	TOTAL	AVERAGE PER INVESTIGATOR
JANUARY	7	5	6	11	1.6
FEBRUARY	7	36	20	56	8.0
MARCH	7	40	15	55	8.0
APRIL	7	37	20	57	8.0
MAY	7	25	15	40	5.7
JUNE	7	15	10	25	3.6
JULY	8	55	5	60	7.6
AUGUST	8	13	10	23	3.0
SEPTEMBER	8	74	93	167	20.9
OCTOBER	8	175	58	233	29.1
NOVEMBER	8	168	45	213	26.6
TOTAL		643	297	940	10.7

Civil Aeronautics Board
January 9, 1960

E

FOREIGN AID IN ACCIDENT INVESTIGATION
CALENDAR YEAR 1959

NATION REQUESTING ASSISTANCE	ACCIDENT AIRCRAFT LOCATION DATE	MAN HOURS ASSISTANCE		
		INVESTIGATION DIVISION	ENGINEERING DIVISION	TOTAL
HOLLAND	Lockheed 1049H, PH-LKM; Atlantic Ocean; August 14, 1958	- - -	224:00	224:00
GUATEMALA	Curtiss C-46F, N 10425; Guatemala City, Guatemala; November 6, 1958	- - -	40:00	40:00
FRANCE	Boeing 707-121, N 709PA; Menil-Scelluer, France February 25, 1959	148:00	120:00	268:00
IRELAND	Douglas DC-6B, N 5026K; Shannon, Ireland; June 21, 1959	- - -	53:00	53:00
ITALY	Lockheed 1649A, N 7313C; Milan, Italy; June 26, 1959	- - -	850:00	850:00
GREECE	Douglas DC-3A, SX-BAD; Athens, Greece; October 29, 1959	211:00	36:00	247:00
TOTAL	MAN HOURS	359:00	1,323:00	1,682:00
	MAN DAYS	44.9	165.3	210.2

Civil Aeronautics Board
December 30, 1959

F

RECOMMENDATIONS SUBMITTED BY ENGINEERING DIVISION
BUREAU OF SAFETY DURING CALENDAR YEAR 1959

Accident. Johnson and Johnson Learstar, N37500, Woonsocket, Rhode Island, December 15, 1958. Both engines lost power while flying in snow storm, crashed in wooded area.

Recommendation. To FAA on January 7, 1959.
1. Re-evaluate adequacy of carburetor induction heat system.
2. Provide more detailed instructions in flight manual for use of carburetor heat and alcohol to combat induction icing.

Results.
1. FAA advised June 9, 1959 information available indicated the Learstar is adequately equipped to cope with induction icing if properly employed.
2. FAA advised June 9, 1959 new manual material re this matter was being prepared. (Note: This material was subsequently received, questioned, and is currently being revised the second time.)
3. Bureau of Safety continued its investigation of Learstar carburetor heat rise, flight tests in December 1959 and communications from Learstar operators show heat rise to be inadequate. This information furnished FAA at meeting December 17. Not closed.

Accident. Alaska Coastal Airlines, Hiller UH-120, N5316V, Juneau, Alaska, August 28, 1958. Power loss following takeoff, crashed and sank in lake.

Recommendation. To FAA on January 15, 1959. Inferior workmanship on carburetor float assembly cited with recommendation that quality control procedures of manufacturer be re-evaluated.

Results. FAA advised January 26, 1959 the recommendation with supporting data was being furnished to their appropriate Regional office with instructions that the quality control methods of the manufacturer be investigated.

Accident. Seaboard and Western Airlines, Lockheed L-1049D, N6503C, Idlewild Airport, New York, November 10, 1958. Loss of propeller control during takeoff caused N6503C to crash into a Viscount aircraft parked on ramp.

Recommendation. To FAA on January 19, 1959. (Supplemented recommendations dated December 19, 1959.) Inferior workmanship of overhaul agency cited with recommendation that their overhaul procedures be reviewed to ensure that satisfactory airworthiness standards are maintained.

Recommendations Submitted by Engineering Division -2-

Results. FAA advised March 12, 1959 that they held a Production Certification Board meeting at the factory on February 25-27. Unsatisfactory procedures and conditions were called to the management's attention with the request for corrective action. Supervising Inspector was directed to determine that corrective action is complete and proper prior to a recommendation that the production certificate be continued.

Accident. Aerovias Sud Americana, C46F, N10425, Guatemala City, Guatemala, November 6, 1957. One engine failed, unable to maintain altitude and crashed in residential area.

Recommendation. To FAA dated January 20, 1959. Deep tool marks and other indications of rough machining in the fillet area of the failed crankshaft were cited with the recommendation that necessary action be taken to ensure the overhaul agency maintain satisfactory workmanship standards.

Results. No answer from FAA as of this date.

Accident. Bell Helicopter 47J, N6718D, Santa Rosa, New Mexico, January 13, 1959. Tail rotor blade failed from fatigue while in flight.

Recommendation. To FAA dated February 9, 1959 cited the fatigue failure of tail rotor blade and special inspection called for in manufacturer's service bulletin with recommendation this inspection be made mandatory by Airworthiness Directive. A Safety Bulletin prepared by Bell but applicable to most all model helicopters was mentioned with the suggestion that the information contained therein be given wide circulation.

Results. FAA advised March 19, 1959 that AD 59-9-1 requiring daily inspections of tail rotor blades had been issued and that the information in the Safety Bulletin would be widely circulated.

Accident. Air France, L-1049G, F-BGNE, New York International Airport, February 6, 1959. Landing gear collapse account fatigue failure at the cap to cylinder juncture of the shock strut.

Recommendation. To FAA on February 18, 1959. Lack of penetration at the root of the weld and evidence of internal stresses were cited with the recommendation that an Airworthiness Directive requiring x-ray inspections at each overhaul be issued and that quality control procedures of the manufacturer be investigated.

Results. Airworthiness Directive 59-7-3 dated April 6 requiring specific x-rays issued. FAA Regional Office instructed to inspect manufacturer's quality control procedures.

Recommendations Submitted by Engineering Division -3-

Accident. Trans World Airlines, L-1049, N6901C, Olathe, Kansas, January 17, 1959. Landing gear failed to extend to a down and locked position and a wheels-up landing was made.

Recommendation. To FAA dated February 25, 1959. The fatigue failure along an indentation of the stub shaft of the down lock guide assembly and cracks in five other stub shafts were cited with the recommendations:

1. Stub shafts of the down lock guide assemblies of all aircraft be inspected immediately.
2. Require that an improved down lock guide assembly available from the manufacturer be installed on all appropriate aircraft.

Results. Airworthiness Directive 59-3-2 dated February 9, 1959 required special inspections and replacement of the down lock guide assembly.

Incident. Delta Airlines DC-6, N1901M at Birmingham, Alabama on September 8, 1958. During landing roll, all four propellers feathered unexpectedly following application of reverse thrust.

Recommendation. To FAA dated March 9, 1959. Misrigging of the throttle controls which caused the incident was cited with the recommendation that an Alert Bulletin detailing the incident and cause be circulated.

Results. FAA Air Carrier Alert Bulletin No. 19 dated May 8, 1959, subject, "Unintended Feathering of Propellers During Landing Roll Upon Application of Reverse Thrust - Douglas DC6/7" was issued.

Accident. Eastern Air Lines Lockheed L-1049G, N6240C, Miami, Florida, on January 17, 1959. Engine failure and uncontrolled fire shortly after takeoff. Fire progressed into Zone IIIA.

Recommendation. To FAA March 23, 1959. Lack of fire detection and extinguishing agent in Zone IIIA was cited with the recommendation that detectors, extinguishing agent, and relocation or shielding of fuel system components be considered.

A second EAL L-1049G engine failure and fire on March 25 prompted a second letter dated March 27 to FAA extending the original recommendation to include requiring fire proof landing gear well doors.

Results. FAA advised on April 6, 1959 that above information was being forwarded to their Los Angeles office with the request to re-evaluate fire protection in Constellation series aircraft. Engineering Division personnel have participated in one FAA-industry meeting re a proposed Airworthiness Directive.

Recommendations Submitted by Engineering Division -4-

Accident. Hiller Helicopter UH12C, N5321V at St. Paul, Minnesota, August 27, 1958. Shortly after takeoff, clutch slipped and disengaged requiring an immediate auto-rotation landing on slanting terrain.

Recommendation. To FAA dated March 27, 1959. Circumstances of the accident were cited with the recommendation that more frequent inspections of the mercury clutch be required, particularly when the operation involved numerous short flights.

Results. FAA advised consultation with the manufacturer revealed momentary slippage of the sprag clutch was the more likely cause of this accident and the design of the sprag clutch was being reviewed in order to minimize the occurrence of momentary slippage.

Accident. PAA Boeing 707-121 at Menil Scelleur, France, on February 25, 1959. Control of the aircraft was lost during training during which structural damage and breakaway of one engine occurred.

Recommendation. To FAA dated March 27, 1959. A deficiency in the flight recorder installation whereby heading information was not recorded immediately after takeoff was cited with the recommendation that this deficiency be corrected. As installed, it failed to comply with the Civil Air Regulations.

Results. FAA advised on June 1, 1959 that the manufacturer was being advised of this apparent deficiency and requested to take immediate action to modify all aircraft as required.

Accident. Riddle Airlines C-46R, N7040B at Alma, Georgia, March 30, 1959. Fire in flight in the rear cargo compartment and subsequent loss of control caused aircraft to crash.

Recommendation. To FAA dated May 1, 1959. Potential hazards with respect to fire found in the belly compartments of Riddle Airlines C-46 aircraft during the investigation were cited with the recommendation that measures be taken to make certain like hazards did not exist or were corrected on other C-46 aircraft.

Results. FAA Air Carrier Maintenance Alert Bulletin No. 59-5 dated August 6, 1959 dealt with the problem as detailed in the recommendation.

Accident. Hiller UH12-13 Helicopter, N6160H at Sitka, Alaska, July 24, 1958. Complete loss of power occurred at altitude of 150 feet about one minute after takeoff. An auto-rotational landing was made in the water.

Recommendation. To FAA dated April 7, 1959. How use of the emergency fuel pump would have prevented this accident was cited with the following recommendations:

1. Issue Alert Bulletin emphasizing use of emergency fuel pump when appropriate.
2. Revise Operating Procedures of the Flight Manual on appropriate aircraft to detail use of emergency fuel pump.
3. Amend Parts 6 and 7 of the Civil Air Regulations to require emergency fuel pumps to be turned on where appropriate to the fuel system.

Results. FAA has not advised as of this date what action has been taken.

Accident. American Airlines DC-7, N305AA at Akron, Colorado on April 12, 1959. Loss of propeller control and resultant overspeed caused disintegration of engine impeller and damage to adjacent engine. Forced landing with one propeller windmilling and one feathered was accomplished.

Recommendation. To FAA dated May 8, 1959. Four propeller irregularities attributable to overhaul were noted during the investigation and were cited with the recommendation that inspection and quality control procedures in the overhaul shop be investigated.

Results. FAA has not advised as of this date as to the action taken.

Incident. Delta Airlines DC-7B, N4889C at Chicago, Illinois, February 26, 1959. Speed ring on No. 3 engine came off in flight.

Recommendation. To FAA dated May 13, 1959. Failure of Delta mechanics to completely secure cowl and failure to detect this omission for lack of an adequate inspection by either maintenance personnel or the flight crew during their pre-flight inspection was transmitted to FAA for their information in order that appropriate steps could be taken to preclude a recurrence.

Results. FAA has not advised as of this date what action was taken.

Accident. New York Airways Vertol 44B, N10101 near LaGuardia Field, New York, May 12, 1959. Strap (rotor blade) failed from fatigue causing vibration and a forced landing.

Recommendation. To FAA dated May 19, 1959. Details of the failure and the potential hazards were cited with the following recommendations:

1. Replace all straps having 600 hours in service.
2. x-ray inspect straps daily.
3. V-44 pilots be alerted to vibratory symptoms.

Recommendations Submitted by Engineering Division -6-

Results. FAA advised on September 3, 1959 that a telegraphic alert issued on May 15 and an Airworthiness Directive No. 59-11-2 dated June 1, 1959 required corrective measures as per 1 and 2 above.

Accident. American Airlines Electra L-188 N6101A, LaGuardia Field, New York on February 3, 1959. Aircraft was flown into the water short of runway while attempting an approach under near minimum weather conditions.

Recommendation. To FAA dated May 29, 1959. The TSO system by which the drum type altimeters were introduced into service was discussed and the following issues were raised:

1. The TSO system does not provide for any service testing of new equipment before fleetwide use is permissible and it appears that service testing is desirable for primary safety items.
2. Under the TSO system, FAA exercises no direct control over quality control procedures of the manufacturer and quality control requirements should be a part of the TSO specifications.
3. FAA monitors service difficulties of TSO equipment only when such difficulties are brought to FAA's attention and suggests a more positive approach to follow up of service difficulties.

Results. As of this date there is no reply to these recommendations.

Accident. Capital Airlines Viscount, N7445, Detroit, Michigan, April 3, 1959. Main landing gear uplatch rocking lever failed from fatigue making lowering of the gear by the crew impossible.

Recommendation. To FAA dated June 11, 1959. The nature of the failure and finding three additional cracked rocking levers during a fleetwide inspection by Capital were cited with the recommendation that the manufacturer provide a stronger part and its use on Viscount aircraft be mandatory.

Results. FAA advised on September 14, 1959 that changes made to the original part are considered to be satisfactory when the part is properly maintained and a stronger redesigned part is not required.

Accident. Riddle Airlines C-46R, N7840B, Alma, Georgia, March 30, 1959. An inflight fire originated in the rear belly compartment and the aircraft crashed.

Recommendations Submitted by Engineering Division -7-

Recommendation. To FAA dated June 12, 1959. Circumstances of the accident and the potential hazard of cargo lights when not turned off were cited with the recommendation that a master switch be provided in the cockpit or door actuated switches be installed to preclude lights being on during flight.

Results. This item is included in Proposed Comments on Civil Air Regulations Draft Release 59-14A where it will be considered for regulatory action.

Accident. Bell 47J Helicopter, N2875B at Detroit, Michigan on April 11, 1959. The counterweight bracket assembly failed and it struck the leading edge of the opposite rotor blade.

Recommendation. To FAA dated June 12, 1959. Circumstances of the failure, material and fabrication deficiencies of the failed part and a 200 hour life limitation on the part were cited with the recommendation that installation of a redesigned bracket on all Model 47J helicopters be required.

Results. FAA advised on July 17, 1959 that they considered the allowable service life to be conservative and/satisfactory corrective action and attrition all brackets would be replaced in the near future.

Accident. Mooney M-20, N5276B at Syracuse, Indiana, April 17, 1959. Loss of control followed a fatigue failure of the right side tail attach bracket.

Recommendation. To FAA dated June 22, 1959. Referred to AD 59-9-1 which required special inspections and called attention to inferior workmanship, particularly welding, lack of conformance with material specifications and lack of complete material specifications on the detailed drawing for the failed part and recommended the manufacturer's quality control procedures and the qualifications of personnel doing welding be investigated.

Results. No information regarding this recommendation has been furnished as of this date.

Accident. Bell Helicopter Model 47G-2, N67B, New York, New York, June 15, 1959. Tail rotor blade failed in flight and a crash landing was made in the Hudson River.

Recommendations Submitted by Engineering Division -8-

Recommendation. To FAA dated July 10, 1959. Cited the failure and five other similar failures, all of which occurred on float-equipped helicopters and recommended:

1. Inspections specified in AD 59-5-1 be required before each flight on all float-equipped helicopters and on blades of all rotors that had been installed previously on float-equipped helicopters.
2. As soon as possible, all such blades be replaced with newly approved blades.

Results. No answer from FAA as of this date.

Accident. Piper PA-11, N78790 at Anchorage, Alaska on February 22, 1959. Power loss caused by contamination of the fuel with water initiated the sequence of events ending in a crash.

Recommendation. To FAA dated July 20, 1958. Cited the circumstances of the accident and the inadequacy of provisions for draining water from the fuel systems of aircraft in this category and recommended revisions to the CAR's to require sumps with readily usable drain provisions.

Results. FAA advised on August 10, 1959 that "General Maintenance Inspection Aids Summary" dated September 1958 dealt with this matter and on September 9, 1959 further advised the need for an amendment to the CAR Section 3.444 had been studied and recognized and has been made a specific proposal for the 1959 Airworthiness Conference.

Accident. (1) American Airlines, Los Angeles, California, August 27, 1957
(2) Pan American Airways, Carmen, Mexico, October 8, 1958
(3) Pan American Airways, Shannon, Ireland, June 21, 1958
(1) DC-6A and (2) and (3) DC-6B aircraft
All cases, failure of solid aluminum propeller blades at about the same spanwise location in the shot peened area occurred. Cold bending of the blades (in service) reduced fatigue life sufficiently for failure to occur.

Recommendation. To FAA dated July 16, 1959. Followed continuous collaboration with FAA and the manufacturer during period of development of a suitable tool to accomplish the required face alignment checks. Recommended:

1. Accelerated program to complete initial face alignment checks of all shot peened aluminum alloy propeller blades on DC-6 series aircraft.
2. Require face alignment checks to be repeated at intervals not to exceed 1500 hours.

Recommendations Submitted by Engineering Division -9-

Results. Prior to recommendation, face alignment checks at overhaul and following known/or suspected damage had been required by FAA. As of this date, an AD requiring essentially the same action as recommended is being processed by FAA.

Accident. McCullock Helicopter, N4017K at Maryland, California, July 17, 1959. Following crash in water, passenger had difficulty releasing Brown Line Model WB-2002-2 seat belt. Required help from pilot to finally release belt.

Recommendation. To FAA dated July 24, 1959. Noted circumstances of the accident and detailed apparent design deficiencies of the seat belt buckle and recommended:
1. Determine if belt meets the requirements of TSO C-22.
2. If "no" to 1 replace all belts in service.
3. If "yes" to 1 review requirements of TSO C-22.

Results. AD 59-24-3 dated December 7, 1959 states the subject belt fails to conform to TSO C-22 and is not acceptable for installation in civil aircraft. Belts in service must be replaced with acceptable belts within next 25 hours of service time or the next periodic inspection, which ever comes first.

Accident. TWA Lockheed L-1649A accident near Milan, Italy, June 26, 1959. There was an explosion and breakup while flying in a thunderstorm. Lightning is considered as a probable cause.

Recommendation. To FAA dated August 31, 1959. Circumstances of the accident were cited and the need for additional study of possible lightning hazards associated with vapors in an empty fuel tank was expressed.

Results. FAA advised on September 16, 1959 that additional study in the area recommended was already initiated through an NASA contract. CAB, NASA and FAA coordination has been arranged for this study program.

Incidents. Six cases of Boeing 707 fore flap panel failures.

Recommendation. To FAA dated September 14, 1959. Called attention to the six failures of Boeing 707 fore flap panels and recommended that Boeing be required to redesign the 707 series fore flap to improve fatigue characteristics.

Results. As of this date no information received from the FAA.

Recommendations Submitted by Engineering Division -10-

Accident. Four fatal accidents, Mooney aircraft, in eight months attributable to substandard workmanship or material.

1. Mooney M202A N8107E, Kerrville, Texas, February 6, 1959
2. Mooney M202A N6554B, Detroit, Michigan, March 4, 1959
3. Mooney M202A N5276B, Syracuse, Indiana, April 17, 1959
4. Mooney M18C N4174, Culmerville, Pennsylvania, September 7,1959

Recommendation. To FAA dated October 2, 1959. Cited inferior weld and glue joints and marginal structural design and recommended:

1. That Mooney 18 and 20 series aircraft be grounded until specific corrective measures are accomplished.
2. That Mooney 18 and 20 series aircraft that have accumulated time be static-tested to determine if they conform to strength requirements.

Results. FAA advised December 7, 1959 that requirements contained in their AD 59-22-3 are, in their opinion, adequate to eliminate any serious defects that may be found in any existing Mooney aircraft. Grounding of these aircraft was not considered necessary.

Incident. Eastern Air Lines Electra L-188, New York International Airport, October 22, 1959. Substantial wing structural damage while underwing fueling because excessive pressure was developed inside the tank.

Recommendation. To FAA dated October 27, 1959. Circumstances of the incident were cited and it was recommended that until such time as the cause of this incident was determined all underwing fueling be accomplished with the overwing fuel tank caps removed. Eastern Air Lines had established this procedure on their own initiative.

Results. FAA advised on December 9 that priority telegraphic messages were sent to all Regional Administrators apprising them of the facts with instructions to inspectors to determine that all operators have suitable procedures established to prevent damage.

Incident. Eastern Airlines Electra L-188, New York International Airport, October 22, 1959. Following damage to the wing while pressure fueling and finding a paper cup at the seat of one of the control valves during the investigation, a fleet campaign to inspect the fueling manifold was conducted. Foreign objects were found in the fueling system of two more aircraft.

Recommendations Submitted by Engineering Division -11-

Recommendation. To FAA dated October 29, 1959. Cited the above occurrences of foreign objects in the fueling manifolds and recommended that like inspections be made on all Electra aircraft.

Results. FAA advised on December 9, 1959 that all Regional Administrators were advised of this situation by priority telegraphic messages with the recommendation that fueling manifolds and valves be checked for foreign material.

Incident. Two instances of operation of Boeing 707 aircraft with flight recorders turned "off".

Recommendation. To FAA dated November 5, 1959. Cited details of the two above mentioned occurrences and recommended that the oleo actuated switch be retained in addition to any switch to be operated by the crew that might be installed.

Results. No reply has been received from the FAA as of this date.

Accident. Aeronca 65-CA, N39310, Hayti, Missouri, March 25, 1959. Aircraft crashed from low altitude, safety belt broke and pilot sustained fatal injuries. The safety belt was tested and failed at an average of 588 pounds, tensile load.

Recommendation. To FAA dated November 12, 1959. Cited above information and recommended that all safety belts not conforming with TSO standards be removed and establish a study program aimed at establishing a realistic service life for these components.

Results. There has been verbal information indicating TSO belts will be required on all aircraft.

Accident. Trans World Airlines L-1649A, near Milan, Italy. Explosion and breakup occurred while climbing in an area of thunderstorms.

Recommendation. To FAA dated November 20, 1959. Referred to recent discussions of various aspects of this accident and recommended requiring by AD that one side of the No. 7 fuel tank be blocked off.

Results. No reply has been received from the FAA as of this date.

Recommendations Submitted by Engineering Division -12-

Accident. Piper PA22, N9530D at Plum Grove, Pennsylvania, April 23, 1959. Aircraft control malfunctioning prompted an attempted landing on farm land.

Recommendation. To FAA dated December 7, 1959. This non-fatal accident was investigated by FAA. The cause of the control difficulty was not determined and it was recommended that further investigative effort be expended because of the potentially hazardous nature of the occurrence. The aircraft was equipped with an autopilot and it was recommended that special attention be directed to this unit.

Results. No reply has been received from the FAA as of this date.

RECOMMENDATIONS SUBMITTED
BY OPERATIONS DIVISION, BUREAU OF SAFETY
CALENDAR YEAR 1959

1. Accident

American Airlines, Lockheed Electra 188, N6101A, near La Guardia, New York, N. Y., 2/3/59.

Recommendation

Investigation of the accident revealed that there existed no Federal policy guidance or regulatory limitation governing the minimum altitude to which instrument approaches may be conducted using automatic pilots. The Bureau recommended that the FAA initiate a study of air carrier policies, procedures, and techniques for employing an autopilot for instrument approaches and take appropriate action.

Results

A letter dated October 30, 1959, was received from the Director, Bureau of Flight Standards, FAA, in reply to our letter of April 8, 1959, stating in part: "The matter of electronic autopilot use and limitation has been given thorough study by specialists of my staff. It is our intention to establish standardized limitations and criteria for use of the automatic pilot in all air carrier operations. This will be in the form of operations specifications for air carriers operating in accordance with Civil Air Regulations Parts 40, 41, 42, and 45, and will contain essentially the following requirements:" (requirements listed) "It will be necessary for each air carrier to reproduce in its operations manual the maximum altitude loss in the automatic pilot approach configuration, together with emergency operating procedures as specified in the airplane flight manual. Adequate pilot training on the equipment also will be required."

2. Accident

Capital Airlines Viscount near Chase, Maryland, 5/12/59.

Recommendation

Investigation of the accident to the Capital Airlines Viscount at Chase, Maryland on May 12, 1959, disclosed that significant weather information had not been transmitted to the pilot in flight. The Board's public accident report of October 19, 1959, pointed up this fact and the importance of passing significant weather information to air carrier pilots while enroute.

Results

An extensive study was completed of airline operational control methods and the facilities and services for the transmission of significant weather information to air crews. The results of this study have been forwarded to the FAA and the Weather Bureau. Interagency meetings have been set up for the purpose of arriving at a suitable solution to the serious problems revealed by this study. Letter received from the Administrator dated November 2, 1959 in answer to our letter of September 18, 1959, states in part: "With regard to dissemination of weather information by FAA personnel, we also have been dissatisfied with the adequacy of the present program. A greatly improved preflight and in-flight assistance program is under development by our Bureau of Air Traffic Management. ATM personnel will be available to discuss this program with representatives of the Board at their convenience."

3. Accident

Piedmont Airlines DC-3, near Charlottesville, Va., 10/30/59.

Recommendation

Investigation of this accident revealed that the FAA procedures for the establishment, approval, and subsequent flight checking of

private navigational facilities are not accomplished with the same thoroughness as is applied to procedures based on public facilities. The Board recommended to the FAA that the same controls to assure accuracy and reliability should be applied in the development and periodic checking of private facilities as are used for public facilities.

Results

Matter under discussion with FAA.

4. Accident

Beech Bonanza near Mason City, Iowa, 2/3/59.

Recommendation

Investigation of a fatal accident to a Beech Bonanza engaged in night air taxi operations near Mason City, Iowa, revealed that the pilot, although not holding an instrument rating, conducted a flight in instrument weather conditions with which he was not able to cope. Accordingly, the Board recommended to the FAA on September 18, 1959, that Part 47 of the Civil Air Regulations - Air Taxi Certification and Operation Rules and Rules Governing Other Small Aircraft Commercial Operations - be amended to provide:

(a) That any pilot serving as pilot in command in air taxi operations conducted at night shall possess a valid instrument rating.

(b) That prior to engaging in IFR or night VFR flight in air taxi operations the pilot shall have demonstrated to a company check pilot, or in a manner otherwise approved by the Administrator, his ability to utilize flight instruments and radio navigation equipment of the type installed in the aircraft to be used.

(c) That aircraft to be used in air taxi operations at night shall be equipped for instrument flight in accordance with Section 43.30 of Part 43 of the Civil Air Regulations.

Results

Reply to our recommendations to FAA of September 18, 1959, was received, dated November 2, 1959, from the Administrator. His letter stated in part: "A working group within the Bureau of Flight Standards is presently engaged in revising Part 47 and, with minor exceptions, the proposed revisions appear to adequately reflect your thinking... For night passenger operations, the aircraft shall be basically equipped for instrument flight in accordance with section 43.30(c) of the CAR. This is in addition to the night flight equipment requirements of section 43.30(b) of the CAR." Since the dissemination of weather information by FAA personnel was also a question under discussion in the investigation of this accident, the same statement from FAA in their September 18, 1959 letter as is set forth under "Results" in the Mason City accident applies.

5. Accident

Lockheed Learstar N37500, Woonsocket, Rhode Island, 12/15/58.

Recommendation

Investigation of an accident to a Lockheed Learstar, which occurred near Woonsocket, R. I. on December 15, 1958, indicated that there was a deficiency in the aircraft icing forecasts for the area involved. The Board's report of this accident, released September 11, 1959, prompted the Weather Bureau to alert all Flight Advisory Weather Service Centers to the need for giving more specific attention to icing situations in the aviation forecasts, advices, and warnings.

Investigation of this accident also revealed that the carburetor heat system in Learstar aircraft is not adequate to prevent engine failure from induction icing.

Results

Flight Advisory Weather Service Centers are requested by the Weather Bureau to review the techniques and procedures related to aircraft icing and give full consideration to this element in the aviation forecasts.

Letter will go forward to FAA recommending that the adequacy of the carburetor air inlet system, the adequacy of the information in the flight information manual with respect to anti-icing and deicing procedures, the testing procedures, and adequacy of the standards be reviewed.

6. Accident

General Airways DC-3 near Kerrville, Texas, 2/1/59.

Recommendation

Investigation of the accident revealed that the very weak financial condition of the carrier was a significant contributing factor to the accident.

Results

Action taken to establish a procedure whereby the Director, Bureau of Air Operations, CAB, will furnish the FAA with an alert concerning any air carrier whose financial condition becomes unstable since such a condition could possibly lead to short cuts or economies which might prejudice the safety of operations.

7. Accident

Piper PA-22 near Dover, Delaware, 9/23/58.

Recommendation

The Board's investigation of this accident was not started until several months after occurrence. At that time, the investigation of accidents to U. S. civil aircraft weighing less than 12,500 pounds

had been delegated to the Administrator of Civil Aeronautics by the Civil Aeronautics Board. Accordingly, the CAA performed an investigation; however, no formal report or finding of probable cause was issued. On December 22, 1958, the estate of the deceased pilot petitioned the CAB in Docket 10095 to investigate this accident and to make public its findings of facts and probable cause. The Board granted this petition and began its investigation of the accident on March 30, 1959. Intensive investigation and study revealed that the probable cause was structural failure resulting from excessive airloads created by wing-tip vortices behind a large aircraft.

Result

The Board issued with its accident report a safety message for pilots pointing up the insidious nature of vortex turbulence streaming back from the wing tips of large aircraft and urging pilots to take all possible precautions to avoid passing close astern of large aircraft in flight.

8. Accident

Eastern Airlines Constellation at Miami, Florida, 1/17/59.

Recommendation

As a result of the factors concerned in this accident a study was made of the current requirements for airport fire-fighting equipment. There are no specific Civil Air Regulations establishing standards for such equipment.

Result

It was determined that while regulatory action was not essential, all possible action should be taken to encourage the placement of fire-fighting equipment and properly trained personnel at air carrier airports.

Results

Flight Advisory Weather Service Centers are requested by the Weather Bureau to review the techniques and procedures related to aircraft icing and give full consideration to this element in the aviation forecasts.

Letter will go forward to FAA recommending that the adequacy of the carburetor air inlet system, the adequacy of the information in the flight information manual with respect to anti-icing and deicing procedures, the testing procedures, and adequacy of the standards be reviewed.

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Recommendation

As a result of the factors concerned in this accident a study was made of the current requirements for airport fire-fighting equipment. There are no specific Civil Air Regulations establishing standards for such equipment.

Result

It was determined that while regulatory action was not essential, all possible action should be taken to encourage the placement of fire-fighting equipment and properly trained personnel at air carrier airports.

It was further determined that the standards established by The National Fire Protection Association (NFPA) are practical and reasonable and should be met by air carrier airports.

CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY
SAFETY ANALYSIS DIVISION

Special Projects
(1959)

1 - Report on use of emergency exits in Scheduled Passenger operations accidents.

2 - Airline accident and exposure data for National Safety Council safety award eligibility determination.

3 - Report to National Safety Council on aircraft accident Statistical Factors for 1959 edition of Accident Facts.

4 - Accident statistical detail for 1959 edition of FAA Statistical Handbook.

5 - Report on fires caused by smoking in or near aircraft, 1949-1959 current data.

6 - Accident rates per 1000 hours of flying for all multiengine aircraft (air carrier and general aviation) involving improper feathering procedures.

7 - Review and analysis of certain air carrier accidents, 1938 thru 1958, relative to altimeter procedures.

8 - Study of accidents involving collision with snowbanks, ice or snow on runway area for 1954 thru 1958.

9 - Power plant fires during 1958, involving Air Carrier and General Aviation aircraft over 12,500 lbs.

10 - Study of the physiological aspects of caffeine, NO-DOZ and caffeine derivatives. In support of Houston accident.

11 - Data in support of investigation, Capital Airlines Viscount accident, Chase, Maryland 5/12/59. Included record of all Viscount accidents, lightning strikes, thunderstorm accidents, inflight structural failures.

12 - Analysis of accidents involving Capital Airlines accident at Charleston, West Virginia.

13 - Lightning and fuel hazards to aircraft in flight in relation to the investigation of Capital Airlines' accident at Chase, Maryland.

Special Projects (Continued)

14 - Report on General Aviation accidents in Military flying clubs.

15 - Report on Structural Failure accidents, 1948 thru 1958.

16 - Report on Air Carrier accidents involving slick or snow-covered runway. 1948 thru 1958.

17 - Report on Landing and Takeoff accidents in Air Carrier operations 1958.

18 - Study of Air Carrier accidents involving icing conditions from 1949 to date.

19 - Statistical study of all accidents and incidents involving B-707 aircraft.

20 - Pilot age and experience in Air Carrier accidents that involved pilot causal factors 1951 - 1958.

21 - Report on Air Carrier accidents as a result of turbulence 1950 thru 1958.

22 - Review of studies and tests on runway foaming in wheels up landings.

23 - Report on Wheels-up landings in Scheduled Domestic Air Carrier operations, including unsymmetrical landing gear configurations, 1950 to 1959.

24 - Survey of General Aviation fatal accidents involving Beechcraft model 35 aircraft.

25 - Summary of Bird Strikes in Air Carrier Operations, 1951 to date.

26 - Summary of C-46 accidents involving elevator controls.

27 - Report on Air Carrier accidents all operations, rates, fatalities, aircraft destroyed, miles flown, 1954 thru 1958.

28 - Piper PA-22 summary of accidents involving power failure on takeoff/initial climb which are attributed to fuel system problems. 1/1/59 to date.

Special Projects (Continued)

29 - Mooney "Mite" (18 series) accidents, 1949 - 1959. Accidents to Mooney M-20, 1/1/59 to date.

30 - Light plane accidents due to trailing vortices 1949-1953 and 1959.

31 - Lockheed L-18 and Learstar accidents in General Aviation operations, 1949 to date.

32 - Light aircraft fuel problems, 1950 thru 1953 and 1959 to date.

33 - Number of accidents caused by (or influenced by) ice or rain on windshield, 1953 thru 1959. Excluded General Aviation under 12,500 lbs.

34 - Statistical report on Crop Control accidents 1959.

35 - Technical report on flame properties of acetate materail relative to Braniff Electra, Buffalo, Texas.

36 - Resume of Daily Mechanical Interruption Reports, B-707 aircraft.

37 - Air Carrier accidents involving copilot, 1948 thru 1958.

38 - Report on General Aviation accidents involving inadvertent gear retraction and failure to extend gear in the 1st 1,000 accidents - 1959.

39 - Report on accidents involving Air Carrier and General Aviation aircraft within 1/4, 1/2, 3/4, 1,2,3,4,5, miles of airport. 1954 thru 1958 Continental U. S. only.

40 - Report on landing and takeoff accidents under IFR conditions involving Air Carrier aircraft.

41 - Ten year resume of Beech D-18 accidents.

42 - Resume of DC-3 accidents, incidents, and DMR's 1958 to date.

Special Projects (Continued)

43 - Study of Air Carrier accidents involving instrument approaches.

44 - Research of law, practices, procedures relative to autopsy in the United States.

45 - Report on landing and approach accidents with copilot at controls, air carrier operations, 1954 thru 1958.

46 - Statistical analysis of Air Carrier accidents and incidents involving powerplant failure 1949 thru 1958.

47 - Report on all aircraft fires involving faulty oxygen systems, 1950 to date.

48 - Analysis of material and material properties used in aerial applications.

CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY
SAFETY ANALYSIS DIVISION
December 29, 1959

ENGINEERING DIVISION

Project Status Report

1. Structural Fatigue Failures in Civil Aircraft Accidents
2. Review of Transport Landing Gear Accidents for the Period 1949-1958
3. Study of Flight Recorder Records from Three 707 Accidents
4. Review of Alaskan Air Carrier Accidents
5. Powerplant Fatigue Failures in Civil Aircraft Accidents
6. Review of Transport Powerplant Accidents for the Period 1949-1958
7. Multiple Engine Failures as a Factor in Transport Accidents
8. Carburetor Icing Study, Lightplanes
9. Emergency Radio Transmitters
10. Reliability of Airborne Navigation Aids
11. Potential Microwave Radiation Hazards
12. Review of Transport Accidents, Incidents, and DMR's Involving Hydraulic Systems Failures, and/or Malfunctions for the Period 1949-1958
13. Review of Transport Accidents, Incidents, and DMR's Involving Failure and/or Malfunction of Electrical System Components for the Period 1949-1958
14. Re-evaluation of Accident Investigation Report on TWA M-404 Albuquerque, New Mexico
15. Flight Attendant Seating
16. Technical Analysis of L-18 Accidents
17. Visual Detection of Aircraft Through the Atmosphere
18. Development of Monitoring Procedures for New Jet Transports
19. American Airlines L-188 East River Accident Crash Injury Study
20. Review of Transport Accidents Involving Maintenance Procedures and Personnel for the Period 1949-1958
21. Capital Airlines L-049 Accident at Charleston, West Virginia, Crash/Injury Study

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STUDY PROJECTS COMPLETED DURING
CALENDAR YEAR 1959
OPERATIONS DIVISION

1. Autopsies

A study was conducted on the value of autopsies in accident investigation, the problems incident to securing autopsies in the various States, and the manner in which other Government agencies services in this respect might be utilized. In cooperation with the Safety Analysis Division, the machinery for accomplishment of autopsies was established and a chart delineating the legal requirements and proper authorities to contact was prepared and provided to the field offices for inclusion in the Investigation Manual.

2. U. S. Airlines Operational Control Study

An extensive study was completed of airline operational control methods and the facilities and services for the transmission of significant weather information to air crews. The results of this study have been forwarded to the FAA and the Weather Bureau. Interagency meetings have been set up for the purpose of arriving at a suitable solution to the serious problems revealed by this study.

3. Current Review of Weather Accidents - General Aviation

This is a continuing project aimed at determining the relationship between pilot qualification and involvement in fatal weather accidents.

4. Cross-Wind Accidents and Accidents Involving Strong and/or Gusty Winds

An analysis is being made of cross-wind and strong and/or gusty wind accidents on takeoff, landing, and taxiing, to determine whether any corrective measures concerning observing and reporting methods are feasible.

HEARINGS, DEPOSITIONS, AND REPORTS

Calendar Year 1959

	Date of Hearing	Reports Released	Pending
1. Southeast Airlines DC-3, N 18941, nr. Tri-City Airport, Bristol, Tenn. January 8, 1959	3/2/59	9/11/59	
2. Eastern Airlines Constellation, Lockheed 1049G, N 6240G, Miami, Florida, January 17, 1959	3/30/59	9/20/59	
3. American Airlines Electra 188, N 6101A, nr. La Guardia Airport, New York, February 3, 1959	3/18/59	1/10/60	~~X~~
4. Capital Airlines Constellation, N 2735A, Charleston, W. Virginia, May 12, 1959	6/24,25/59		X
5. Capital Airlines Viscount, N 7463 nr. Chase, Maryland, May 12, 1959	7/8/59	10/24/59	
6. Pan American World Airways, Boeing 707, N 707PA, New York International Airport, New York, July 11-12,1959	7/30,31/59		X
7. American Airlines, Boeing 707, N 7514A, Calverton, Long Island, New York, August 15, 1959	8/27/59 and 10/7/59		X

	Date of Hearing	Reports Released	Pending
8. Beech C-18, N 57139, nr. McGrath, Alaska, September 1, 1959	9/17/59		X
9. Reeve Aleutian Airways, Douglas DC-4, N 63396, Great Sitkin Island, Alaska, September 24, 1959	10/13/59		X
10. Braniff Airways Lockheed Electra 188 N 9705, nr. Buffalo, Texas, September 29, 1959	10/21/59		X
11. Boeing Aircraft Co., Boeing 707, N 7071, nr. Arlington, Washington, October 19, 1959	11/19/59		X
12. Piedmont Airlines DC-3, N 55V, nr. Charlottesville, Virginia, October 30, 1959	12/10,11,12/59		X

	Depositions	Reports Released	Pending
1. Ground Collision, Seaboard & Western L-1049D, N 6503C, and Trans-Canada Viscount, New York Int'l. Airport, New York, November 10, 1958	1/5/59		X
2. Alouette Helicopter, N 526, nr. Lake Charles, Louisiana, December 2, 1958	1/27-29/59	8/8/59	

		Depositions	Reports Released	Pending
3.	Johnson & Johnson, Lockheed Learstar, N 37500, Woonsocket, Rhode Island, 12/15/58	2/5/59	9/11/59	
4.	Beech Bonanza, N 3794N, Mason City, Iowa, February 3, 1959	2/18/59	9/23/59	
5.	General Airlines DC-3, N 17314, Kerrville, Texas, February 1, 1959	3/4/59	9/23/59	
6.	Pan American World Airways, Boeing 707, N 712, over the Atlantic Ocean between London, England, and Gander, Newfoundland, February 3, 1959	3/11,12/59 and 4/1,6,7/59	11/3/59	
7.	American Airlines, CV-240, Cargo Flight 2815, N 94273, Chicago, Illinois, March 15, 1959	4/21/59	10/9/59	
8.	Riddle Airlines, Cargo Flight 402/30, N 7840B, Alma, Georgia, March 30, 1959	5/19-21/59	9/1/59	
9.	Continental Can Co., N 1502, nr. Marion, Ohio, July 1,1959	7/27/59		X
10.	Capital Airlines, DC-3, N 44993, Charleston, W. Virginia, August 26, 1959	9/1,2/59 and 9/22/59		X
11.	AAXICO, C-46, N 5140, Abilene, Texas, September 2, 1959	9/21,24/59 10/23/59		X
12.	Mooney, N 4174, Culmerville Airport, nr. Culmerville, Pennsylvania, September 7, 1959	10/13,15/59		X

		Depositions	Reports Released	Pending
13.	Collision, Civil Air Patrol, Aeronca L-16, N 9330H, and a Cessna 140, N 1652V, nr. North Philadelphia Airport, Philadelphia, Pennsylvania, September 30, 1959	11/13/59		X
14.	Pacific Air Lines, Douglas DC-3, N 67589, Santa Maria, California, October 26, 1959	12/2,3/59		X

		Reports Only	Reports Released
1.	Piper, N 2945P, near Dover, Delaware, September 23, 1958		10/10/59
2.	Eastern Airlines, DC-7B, N 824D, Washington National Airport, May 6, 1959		8/23/59

ACCIDENT INVESTIGATION REPORTS OF HEARINGS HELD IN 1958 AND COMPLETED IN 1959

Accident	Date of Hearing	Reports Released
1. Braniff Airways, Inc., DC-7, N 5904, Miami, Florida, March 25, 1958	5/7/58	1/12/59
2. Capital Airlines, Inc., Viscount N 437, Freeland, Michigan, April 6, 1958	7/8/58	4/15/59
3. Midair Collision - Capital Viscount and National Guard T-33, nr. Brunswick, Maryland, May 20, 1958	6/30/58	1/9/59
4. Beechcraft Travel Air, N 819B, near Little Rock, Arkansas, July 22, 1958	8/26/58	4/1/59
5. Northeast Airlines, Inc., Convair 240, N 90670, Nantucket, Massachusetts, August 15, 1958	10/1/58	3/26/59
6. Alaska Coastal Airlines, Grumann G 21A, N 4774C, nr. Haines, Alaska, August 20, 1958	9/23/58	9/3/59

ACCIDENT INVESTIGATION REPORTS OF DEPOSITIONS TAKEN IN 1958 AND REPORT COMPLETED IN 1959

Accident	Date of Depositions	Reports Released
1. Lockheed Lodestar, N 300E, nr. Grants, New Mexico, March 22, 1958	7/10/58 7/30,31/58	4/17/59
2. Capital Airlines, DC-3, N 49553, nr. Martinsburg, W. Virginia, June 4, 1958	7/10,11,15, 8/15/58	7/6/59
3. Northwest Airlines, Douglas DC-6B, N 575, Minneapolis, Minnesota, August 28, 1958	10/2/58	7/2/59
4. Frontier Airlines, DC-3, N 6424, Pueblo, Colorado, August 23, 1958	10/20-23/58	7/16/59

RESPONSES MADE TO PUBLIC INQUIRIES FOR
FACTUAL INFORMATION ON INDIVIDUAL AIRCRAFT ACCIDENTS
Calendar Year 1959

Month	Replies to Letters of Inquiry	Photostats Prepared	Certifications
January	73	2,000	1
February	105	537	4
March	142	1,693	1
April	119	1,467	6
May	115	1,440	1
June	149	996	1
July	200	1,795	1
August	173	1,830	-
September ...	235	2,343	2
October	215	2,020	2
November	193	2,548	6
December	227	3,550	1
Total	1,946	22,219	26

Civil Aeronautics Board
Bureau of Safety
December 31, 1959

FATAL ACCIDENTS INVOLVING SCHEDULED AIRLINES
(Calendar Year 1959)

DOMESTIC OPERATIONS

				Division of Injury																
				Pilot			Copilot			Other Crew			Passengers			Others			Total		
Date	Location	Aircraft	Operator	F	S	M/N	F	S	M/N	F	S	M/N	F	S	M/N	F	S	M/N	F	S	M/N
Passenger Services																					
2/3/59	New York, N. Y.	L-188	American	1				1		1	2		63	5					65	8	0
5/12/59	Charleston, W. Va.	L-049	Capital		1			1		1	1	2	1	2	35				2	5	37
5/12/59	Chase, Md.	V-745D	Capital	1			1			2			27						31	0	0
9/29/59	Buffalo, Tex.	L-188	Braniff	1			1			5			27						34	0	0
10/26/59	Santa Maria, Calif.	DC-3	Pacific		1		1				1			1	15				1	2	16
10/30/59	Charlottesville, Va.	DC-3	Piedmont	1			1			1			23	1					26	1	0
11/13/59	Gulf of Mexico, 70 mi. S. of Biloxi, Miss.	DC-7B	National	1			1			4			36						42	0	0
12/1/59	Williamsport, Pa.	M-404	Allegheny	1			1			2			21	1					25	1	0
			Subtotal.....	6	2	0	6	2	0	16	3	3	198	10	50				226	17	53
Other Revenue Services																					
11/21/59	Chicago, Ill.	L-1049H	Trans World	1			1			1						8			11		
Nonrevenue Services																					
6/3/59	Idlewild, N. Y.	L-1049H	Trans World			1			1			1				1			1	0	3
8/15/59	Calverton, N. Y.	B-707	American	1			1			1									5	0	0
			Subtotal.....	1	0	1	1	0	1	3	0	1	0	0	0	1	0	0	6	0	3
Certificated Cargo Services																					
3/30/59	Alma, Ga.	C-46	Riddle	1			1												2	0	0
9/2/59	Abilene, Tex.	C-46	AAXICO	1			1												2	0	0
			Subtotal.....	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	0	0

INTERNATIONAL OPERATIONS

Passenger Services																					
4/26/59	Milan, Italy	L-1649A	Trans World	1			1			7			59						68	0	0
Other Revenue Services																					
9/12/59	Tegucigalpa, Honduras	DC-4	PAWA	1			1			1									3	0	0

ALASKAN AIRLINES

Passenger Services																					
7/3/59	Ketchikan, Alaska	Cessna 180	Ellis	1									2						3	0	0
9/21/59	Great Sitkin Island, Alaska	DC-4	Reeve Aleutian	1			1			3			11						16	0	0
			Subtotal.....	2	0	0	1	0	0	3	0	0	13	0	0	0	0	0	19	0	0
Nonscheduled Charter Services																					
1/20/59	Nome, Alaska	Beech 18	Wien Alaska	1															1	0	0

NON-CERTIFICATED (IRREGULAR) AIRLINES
DOMESTIC OPERATIONS

Passenger Services - Military (CAV)																					
2/1/59	Kerrville, Tex.	DC-3	General Airways	1				1		1			1	3	21				3	4	21

INTRA-STATE SCHEDULED AIRLINE

Passenger Services																					
1/6/59	Bristol, Tenn.	DC-3	Southeast	1			1			1			7						10	0	0
			GRAND TOTAL.....	17	2	1	14	3	1	33	3	4	278	13	71	9	0	0	351	21	77

F - Fatal; S - Serious; M/N - Minor/No Injury.

AIRCRAFT ENGAGED IN SCHEDULED AIR TRANSPORTATION BY THE U. S. CERTIFICATED AIR CARRIERS

Make - Model	Number of Aircraft
Boeing 377	29
Boeing 707	47
Convair 240	58
" 340	126
" 440	34
" 540	1
Douglas DC-3	314
" DC-4	79
" DC-6	117
" DC-6A	33
" DC-6B	176
" DC-7A/7B	178
" DC-7C	48
" DC-8	8
Fairchild F-27	34
Lockheed 049/749	106
" 1049	21
" 1049D/1049C	16
" 1049G	38
" 1049H	39
" 1649A	28
" 188	76
Martin 202	20
" 404	89
Vickers 745	67
" 810	15
Curtiss C-46	64
Total	1861

Helicopters	
Bell B-47	6
Sikorsky S-58C	5
" S-55	5
" S-51	2
Vertol V-44B	5
Total No. Helicopters	23

Note: The above figures represent the number of aircraft in service September 30, 1959. Data based on report issued by FAA.

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PRELIMINARY
RECORD
OF
AIR CARRIER ACCIDENTS
(Calendar Year 1959)

CERTIFICATED CARRIERS	Accidents		Fatalities		
	Total	Fatal	Passenger	Crew	Others
Domestic Passenger/Cargo Carriers					
Passenger Service	57	8	198	28	
Cargo Service	2	1	0	3	8
Nonrevenue	10	2	0	5	1
International Passenger/Cargo Carriers					
Passenger Service	9	1	59	9	
Cargo	2	1	0	3	
Nonrevenue	3	0	0	0	
Alaskan Carriers					
Passenger Service	8	2	13	6	
Charter - Cargo	4	1	0	1	
Nonrevenue	3	0	0	0	
All-Cargo Carriers	4	2	0	4	
Total Certificated Carriers	102	18	270	59	9
NONCERTIFICATED CARRIERS					
Passenger - Public	1	0	0	0	
Passenger - Military Contract	4	1	1	2	
Cargo	5	0	0	0	
Total	10	1	1	2	0
SCHEDULED INTRA-STATE					
Passenger Service	1	1	7	3	0
TOTAL - ALL AIR CARRIERS	113	20	278	64	9

Civil Aeronautics Board
January 4, 1960.

PRELIMINARY REPORT

FATAL ACCIDENTS INVOLVING SCHEDULED AIRLINES

(Calendar Year 1959)

DOMESTIC OPERATIONS

Passenger Services

Date	Location	Operator	Aircraft	Type of Accident
2/3/59	New York, N. Y.	American	L-188	Crashed in river during instrument approach.
5/12/59	Charleston, W. Va.	Capital	L-049	Overshot on landing.
5/12/59	Chase, Md.	Capital	V-745D	Disintegrated in flight.
9/29/59	Buffalo, Tex.	Braniff	L-188	Disintegrated in flight.
10/26/59	Santa Maria, Cal.	Pacific	DC-3	Engine fire on takeoff - wheels-up landing.
10/30/59	Charlottesville, Va.	Piedmont	DC-3	Hit mountain during instrument approach.
11/16/59	Gulf of Mexico	National	DC-7B	Crashed in Gulf of Mexico - enroute.
12/1/59	Williamsport, Pa.	Allegheny	M-202	Crashed on mountain following instrument approach.
Other Revenue Services				
11/24/59	Chicago, Ill.	Trans World	L-1049H	Struck buildings on emergency landing approach.
Nonrevenue Services				
6/9/59	Idlewild, N. Y.	Trans World	L-1049H	Aircraft struck panel truck on runup.
8/15/59	Calverton, N. Y.	American	B-707	Dived into ground on landing approach.
Certificated Cargo Services				
9/2/59	Abilene, Tex.	AAXICO	C-46	Aircraft stalled during emergency landing.
3/30/59	Alma, Ga.	Riddle	C-46R	Fire in flight - crashed out of control.

INTERNATIONAL OPERATIONS

Passenger Services				
6/26/59	Milan, Italy	Trans World	L-1649A	Crashed and burned after takeoff - thunderstorms.
Other Revenue Services				
9/12/59	Tegucigalpa, Honduras	PAWA	DC-4	Crashed into mountain in cruise.

PRELIMINARY REPORT
NONFATAL ACCIDENTS INVOLVING SCHEDULED AIRLINES
(Calendar Year 1959

DOMESTIC OPERATIONS

Passenger Services

Date	Location	Operator	Aircraft	Type of Accident
1/15/59	New Orleans, La.	Eastern	DC-7B	Wheels-up landing.
1/17/59	Miami, Fla.	Eastern	L-1049G	Engine fire on takeoff. Ran off runway on landing.
1/17/59	Olathe, Kans.	Trans World	L-1049	Gear up landing.
1/21/59	Emporia, Kans.	United	DC-7	Severe vertical downdraft during cruise.
1/22/59	Huntington, W. Va.	Allegheny	DC-3	Left gear collapsed on landing.
1/27/59	Denver, Colo.	American	DC-7	Turbulence in cruise.
1/27/59	Lansing, Mich.	Capital	V-700D	Gear collapsed on landing.
2/16/59	Chattanooga, Tenn.	Eastern	L-188	Evasive maneuver.
2/17/59	Mattoon, Ill.	Ozark	DC-3	Veered off runway on landing.
3/3/59	San Angelo, Tex.	American	CV-240	Turbulence in cruise.
3/5/59	Chicago, Ill.	Northwest	DC-6B	Turbulence in cruise.
3/8/59	Temple, Tex.	Trans-Texas	DC-3	Turbulence in cruise.
3/16/59	St. Louis, Mo.	Ozark	DC-3	Bird strike in flight.
3/25/59	St. Louis, Mo.	Delta	CV-340	Ground collision.
3/26/59	Chicago, Ill.	American	B-707	Undershot runway.
4/3/59	Detroit, Mich.	Capital	V-700D	Gear up landing.
4/9/59	Houston, Tex.	Cont.	V-812	Veered off runway on landing.
4/12/59	Akron, Colo.	American	DC-7	Propeller overspeed - in flight.
4/19/59	Albuquerque, N. M.	Cont.	V-812	Nose gear failure on takeoff.
5/6/59	Washington, D. C.	Eastern	DC-7	Collided with ILS shack on approach.
5/12/59	Flushing Meadows, N. Y.	N. Y. Awys.	H-44B	Counterweight failed in flight.
5/14/59	Roseburg, Ore.	West Coast	F-27	Aircraft settled in on takeoff.
5/20/59	Abilene, Tex.	American	DC-6	Turbulence in flight.
5/29/59	Idlewild, N. Y.	Eastern	DC-7	Turbulence in flight.
6/6/59	Syracuse, N. Y.	Eastern	M-404	Main gear collapsed on landing.
6/8/59	St. Petersburg, Fla.	Northwest	DC-7C	Engine fire in flight.
6/12/59	New Bern, N. C.	National	CV-440	Hit obstruction during approach.
6/30/59	LaGuardia, N. Y.	Capital	V-700D	Ground collision.

Passenger Services (Continued)

6/30/59 LaGuardia, N. Y. Capitol

Passenger Services (Continued)

Date	Location	Operator	Aircraft	Type of Accident
7/6/59	Las Vegas, Nev.	Trans World	L-1049G	Engine failure in flight.
7/20/59	Boston, Mass.	American	DC-6	Gear retracted on landing.
7/22/59	New York, N. Y.	Eastern	DC-7B	Right gear failed on landing.
7/25/59	Houston, Tex.	Delta	DC-7	Undershot runway.
8/2/59	Pittsburgh, Pa.	Northwest	B-377	Ground collision.
		Capital	DC-3	
8/11/59	Chicago, Ill.	American	B-707	Nose wheel failed on landing.
8/22/59	Chicago, Ill.	United	DC-7	Ground collision.
8/26/59	Charleston, W. Va.	Capital	DC-3	Veered off runway on landing.
9/7/59	Los Angeles, Cal.	American	B-707	Fore flap separated in flight.
9/9/59	Palm Beach, Fla.	Eastern	L-188	Turbulence in flight.
9/11/59	LaGuardia, N. Y.	N.Y.Awys.	H-42A	Cooling fan disc penetrated cabin on takeoff.
9/16/59	Plattsburg, N. Y.	Eastern	M-404	Intentional wheels-up landing.
9/18/59	White Plains, N.Y.	Mohawk	CV-240	Landed with gear retracted.
9/25/59	Miami, Fla.	Delta	DC-7	Engine fire on takeoff.
9/26/59	Macon, Ga.	Eastern	DC-7B	Engine failure in flight.
10/3/59	Grants, N. M.	American	DC-6	Turbulence in flight.
10/6/59	Jacksonville, Fla.	Northeast	DC-6B	Taxied over ground attendant.
11/14/59	Nashville, Tenn.	Eastern	L-188	Fire in flight.
11/24/59	St. Petersburg, Fla.	Eastern	L-188	Left gear failed on landing.
11/26/59	Los Angeles, Calif.	American	B-707	Nose wheel failure on takeoff.
12/7/59	Newark, N. J.	American	DC-6	Skidded off runway on landing.
Other Revenue Services				
3/15/59	Chicago, Ill.	American	CV-240	Collided with steel tower on approach.
Nonrevenue Services				
4/28/59	Greensboro, N. C.	Piedmont	F-27	Gear retracted on landing.
6/5/59	Bakersfield, Cal.	Cont.	DC-7B	Left tires blew on landing.
6/15/59	Ontario, Cal.	Western	L-188	Hard landing.
7/16/59	Bridgeport, Conn.	N.Y.Awys.	H-21	Hard landing (autorotation)
7/31/59	Atlanta, Ga.	Delta	C-46	Ground collision.
8/10/59	Ft. Worth, Tex.	American	L-188A	Veered off runway on landing.

Nonrevenue Services (Continued)

Date	Location	Operator	Aircraft	Type of Accident
8/13/59	Atlantic City, N.J.	Eastern	DC-7	Landed wheels-up.
11/27/59	Los Angeles, Cal.	American	B-707	Tires failed on takeoff.
Certificated Cargo Services				
4/8/59	Portland, Ore.	Flying Tiger	C-46F	Cargo shifted on takeoff.

INTERNATIONAL OPERATIONS

Passenger Services

Date	Location	Operator	Aircraft	Type of Accident
3/30/59	Bangkok, Thailand	PAWA	DC-6B	Propeller struck light standard on runup.
4/10/59	Juneau, Alaska	PAWA	B-377	Undershot runway.
4/11/59	Berlin, Germany	PAWA	DC-4	Bird strike in cruise.
4/24/59	San Juan, P. R.	Carib. Atlant.	DC-3	Ground collision.
6/23/59	Taipei, Taiwan	Northwest	DC-7C	Ran off runway on landing.
7/8/59	Tokyo, Japan	PAWA	B-377	Landed wheels-up.
7/11/59	New York, N. Y.	PAWA	B-707	Nose wheel failed on takeoff.
9/5/59	Honolulu, Hawaii	Northwest	DC-6B	Nose gear collapsed on landing.
Other Revenue Services				
6/21/59	Shannon, Ireland	PAWA	DC-6A	Engine separated from aircraft on takeoff.
Nonrevenue Services				
2/20/59	San Francisco, Cal.	PAWA	DC-7C	Settled in hard on landing.
2/25/59	Chartres, France	PAWA	B-707	Engine separated from aircraft in flight.
4/16/59	Long Island, N. Y.	PAWA	B-707	Undershot runway.
Certificated Cargo Services				
5/8/59	Munich, Germany	Sea. & West.	C-46	Gear collapsed on landing.

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PRELIMINARY REPORT
FATAL ACCIDENTS INVOLVING ALASKAN AIRLINES
(Calendar Year 1959)

Passenger Services

Date	Location	Operator	Aircraft	Type of Accident
7/3/59	Ketchikan, Alaska	Ellis	Cessna 180	Pilot incapacitated in flight.
9/24/59	Great Sitkin Island, Alaska	Reeve Aleutian	DC-4	Aircraft hit a mountain on approach.

Nonscheduled Charter Services

1/20/59	Nome, Alaska	Wien Alaska	Beech 18	Fire on takeoff - struck pole on return.

PRELIMINARY REPORT
NONFATAL ACCIDENTS INVOLVING ALASKAN AIRLINES
(Calendar Year 1959)

Passenger Services

Date	Location	Operator	Aircraft	Type of Accident
3/24/59	Driftwood Bay, Alaska	Reeve Aleut.	DC-3	Hit snow drifts on landing.
3/30/59	E. of Moses Pt. Alaska	North. Cons.	Cessna T-50	Left gear collapsed on landing
4/4/59	W. of Bethel, Alaska	North. Cons.	Cessna T-50	Propeller separated from engine in cruise.
4/28/59	Big Delta, Alaska	Wien	Beech AT-11	Gear collapsed on landing.
5/10/59	Nome, Alaska	Alaska Al.	Piper Apache	Landed wheels-up.
7/5/59	Kulik Lake, Alaska	North. Cons.	Cessna T-50	Pontoon strut failed on landing.

Other Revenue Services

6/16/59	Gilahina Buttes, Alaska	Cordova	Piper PA-14	Aileron cable failed in flight.

Nonrevenue Services

1/31/59	Barter Island, Alaska	Wien	Beech AT-11	Aircraft flew into ground on approach.
8/13/59	Kotzebue, Alaska	Wien	Cessna 180	Right float submerged on takeoff.
11/22/59	W. of Umiat, Alaska	Wien	Cessna 180	Gear collapsed on landing.

Nonscheduled Charter Services

3/30/59	Kotzebue, Alaska	Alaska Al.	C-46	Undershot runway.
5/13/59	Pt. Barrow, Alaska	Wien	Cessna 180	Right gear failed on landing.

PRELIMINARY REPORT
FATAL ACCIDENTS INVOLVING NONCERTIFICATED (IRREGULAR) AIRLINES
(Calendar Year 1959)

DOMESTIC OPERATIONS

Passenger Services - Military (CAM)

Date	Location	Operator	Aircraft	Type of Accident
2/1/59	Kerrville, Tex.	Gen. Awys.	DC-3	Emergency wheels-up landing off airport.

NONFATAL ACCIDENTS INVOLVING NONCERTIFICATED (IRREGULAR) AIRLINES
(Calendar Year 1959)

Passenger Services - Public

8/21/59	Burbank, Cal.	Sourdough	C-46	Ground collision.

Other Revenue Services

5/28/59	Middletown, Pa.	Capitol	C-46	Left gear retracted on landing.
7/27/59	Ontario, Cal.	Great Lakes	DC-6	Nose gear collapsed on landing.
10/15/59	Jacksonville, Fla.	U.S. Overseas	DC-4	Crashed on takeoff.

Passenger Services - Military (CAM)

7/23/59	Denver, Colo.	Miami	C-46A	Right gear retracted on landing.
8/6/59	San Antonio, Tex.	Calif. Hawaiian	DC-4	Engine fire on takeoff.
10/10/59	Winston Salem, N. C.	Miami	C-46	Groundlooped on landing.

INTERNATIONAL

Other Revenue Services - Public

4/6/59	Guam	Transocean	Grumman GA-16	Engine failure - emergency landing.
11/24/59	Wilmington, N. C.	U.S. Overseas	DC-4	Engine fire in flight.

FATAL ACCIDENT INVOLVING INTRA-STATE SCHEDULED AIRLINE

Passenger Services

1/8/59	Bristol, Tenn.	Southeast	DC-3	Hit mountain during instrument approach.

CIVIL AERONAUTICS BOARD
December 21, 1959

CAUSAL FACTORS OF FATAL ACCIDENTS OCCURRING

CAUSAL FACTORS OF FATAL ACCIDENTS OCCURRING IN SCHEDULED DOMESTIC AND INTERNATIONAL PASSENGER OPERATIONS
(Calendar Years 1956-1959)

Causal Factors	1956	1957	1958	Total 1956-1958	1959[a/]
Personnel					
Pilot	3 (37.5%)	4 (57.1%)	5 (38.5%)	12 (42.8%)	4
Maintenance-Inspection					
Airport					
Other Persons	4 (50.0%)	1 (14.3%)	3 (23.0%)	8 (28.6%)	1
Subtotal, Personnel	7 (87.5%)	5 (71.4%)	8 (61.5%)	20 (71.4%)	5
Other than Personnel					
Powerplant	1 (12.5%)		1 (7.7%)	2 (7.1%)	
Airframe					
Landing Gear					
Equipment & Accessories			1 (7.7%)	1 (3.6%)	
Weather		1 (14.3%)	2 (15.4%)	3 (10.7%)	1
Airport Terrain					
Miscellaneous			1 (7.7%)	1 (3.6%)	
Undetermined		1 (14.3%)		1 (3.6%)	
Subtotal, Other	1 (12.5%)	2 (28.6%)	5 (38.5%)	8 (28.6%)	1
Total Causal Factors	8	7	13	28	6[a/]
Total accidents	4	4	6	14	9[a/]

a/ 7 accidents for 1959 still in process.

Excludes propeller accidents to persons.
Excludes Daggett, Calif., 7/25/57 involving suicide.

Civil Aeronautics Board
January 11, 1960

I

AIR CARRIER INCIDENTS AND GROUND ACCIDENT INVESTIGATIONS
(Calendar Year 1959)

Date	Location	Operator	Aircraft
1/8/59	Raleigh, N. C.	Capital	V-745
1/15/59	Philadelphia, Pa.	Trans World	749A
1/22/59	Washington, D. C.	Eastern	M-404
1/22/59	Nr. Hickory, N. C.	Piedmont	F-27
1/31/59	Shemya, Alaska	Northwest	DC-7C
2/3/59	Gander Newfoundland	PAWA	B-707
2/4/59	Milwaukee, Wisc.	Capital	V-745
2/6/59	Pittsburgh, Pa.	Allegheny	DC-3
2/7/59	Nr. Seattle, Wash.	PAWA	B-707
2/10/59	Idlewild, N. Y.	Air France	1649A
2/19/59	Indianapolis, Ind.	American	CV-340
2/26/59	Nr. Chicago, Ill.	Delta	DC-7
3/3/59	Anchorage, Alaska	Alaska	DC-4
3/12/59	Denver, Colo.	Frontier	DC-3
3/14/59	Birmingham, Ala.	Capital	V-745D
3/16/59	Cleveland, Ohio	Eastern	DC-7B
3/18/59	Rio de Janeiro, Brazil	Braniff	DC-7C
3/24/59	Miami, Florida	Eastern	1049C
4/9/59	Chicago, Ill.	Delta	DC-7B
4/9/59	Atlanta, Georgia	Capital	1049
4/22/59	Columbia, Mo.	Trans World	1049G
4/22/59	Miami, Florida	National	DC-6B
5/2/59	Iuka, Illinois	Trans World	1049
5/4/59	Cordova, Alaska	Pacific Northern	L-749
5/19/59	Lake Charles, La.	Trans Texas	DC-3
5/20/59	Abilene, Texas	American	DC-6B
5/21/59	Chicago, Ill.	North Central	DC-3
5/23/59	Chicago, Ill.	American	DC-6
5/27/59	Idlewild, N. Y.	Trans World	B-707
5/31/59	New Orleans, La.	Capital	V-745
6/4/59	Idlewild, N. Y.	Trans World	1649A
6/6/59	Decatur, Illinois	Ozark	DC-3
6/12/59	Norfolk, Va.,	National	440
6/17/59	Miami, Florida	Eastern	L-188
6/24/59	Chicago, Ill.	American	B-707
6/24/59	Los Angeles, Calif.	Pacific	DC-3A
6/28/59	Chicago, Ill	Trans World	B-707
7/1/59	Washington, D. C.	Delta	DC-7
7/6/59	Los Angeles, Calif.	Trans World	1049G
7/6/59	Parkersburg, W. Va.,	Eastern	M-404
7/7/59	Wake Island	Slick	DC-6A
7/7/59	Detroit, Mich.	Capital	V-745
8/29/59	Portland, Oregon	Northwest	DC-7
8/30/59	Juneau, Alaska	Alaska Coastal	PBY5A

Air Carrier Incidents and Ground Accident Investigations (Cont'd)

Date	Location	Operator	Aircraft
7/13/59	Nashville, Tenn.	American	DC-6
7/14/59	San Francisco, Calif.	American	B-707
7/14/59	Los Angeles, Calif.	Continental	B-707
7/14/59	Minneapolis, Minn.	Northwest	B-377
7/15/59	Selingrove, Pa.	Trans World	1649
7/19/59	Rochester, Minn.	Northwest	DC-4
7/21/59	Atlanta, Georgia	Capital	V-745
7/22/59	Tucson, Arizona	American	B-707
7/24/59	Chicago, Ill.	Eastern	M-404
7/27/59	Ontario, Calif.	Great Lakes	DC-6
7/30/59	Pittsburgh, Pa.	Capital	DC-3
8/4/59	Chicago, Ill.	United	DC-7
8/13/59	Atlantic City, N. J.	Eastern	DC-7
8/15/59	Miami, Florida	Eastern	DC-7B
8/21/59	Boston, Mass.	American	B-707
8/21/59	Honolulu, Hawaii	Aloha	F-27
8/24/59	Daggett, Calif.	Trans World	B-707
8/26/59	Las Vegas, Nevada	Continental	B-707
9/7/59	Los Angeles, Calif.	American	B-707
9/12/59	Los Angeles, Calif.	Continental	B-707
9/13/59	Chicago, Ill.	American	DC-6
9/13/59	Chicago, Ill.	Northwest	DC-4
9/13/59	St. Louis, Mo.	Eastern	1049C
9/15/59	Chicago, Ill.	American	L-188
9/22/59	New York, N. Y.	Northwest	DC-4
9/26/59	Detroit, Mich.	American	DC-6B
9/26/59	Portland, Oregon	Northwest	DC-7C
9/30/59	South Bend, Ind.	American	L-188
10/1/59	Mineral Wells, Tex.	National	DC-7
10/6/59	Chicago, Ill.	Trans World	1049G
10/6/59	Chicago, Ill.	Braniff	DC-6
10/6/59	Newark, N. J.	Capital	V-745D
10/8/59	Baltimore, Md.	PAWA	B-707
10/19/59	Palmdale, Calif.	Pacific	M-202
10/19/59	Athens, Greece	Trans World	L-1649A
10/22/59	Idlewild, N. Y.	Eastern	L-188
11/2/59	San Juan, P. R.	Eastern	L-188
11/3/59	Chicago, Ill.	Trans World	1049G
11/4/59	Santa Maria, Calif.	Pacific	M-202
11/4/59	Indianapolis, Ind.	Eastern	DC-7
11/7/59	Idlwild, N. Y.	National	B-707
11/7/59	New York, N. Y.	Northeast	V-745
11/20/59	San Francisco, Calif.	PAWA	B-707
11/21/59	Denver, Colo.	American	B-707
11/26/59	London, England	PAWA	DC-7C
11/27/59	Los Angeles, Calif.	American	B-707
11/27/59	Idlewild, N. Y.	American	B-707
11/30/59	Memphis, Tenn.	American	DC-6
12/7/59	Los Angeles, Calif.	Pacific	DC-3

J

ACCIDENTS IN SCHEDULED DOMESTIC PASSENGER OPERATIONS
(Calendar Years 1938 - 1959 to Date)

Year	Accidents		Fatalities			Passenger Fatality Rate 1/
	Total	Fatal	Passenger	Crew	Total	
1938.....	22	5	25	10	35	4.45
1939.....	27	2	9	3	12	1.19
1940.....	29	3	35	10	45	3.02
1941.....	26	4	35	9	44	2.32
1942.....	23	5	55	16	71	3.66
1943.....	14	2	22	8	30	1.31
1944.....	24	3	48	8	56	2.17
1945.....	33	7	76	11	87	2.22
1946.....	31	9	75	22	97	1.23
1947.....	36	5	199	17	216	3.15
1948.....	53	5	83	15	98	1.32
1949.....	29	4	93	11	104	1.31
1950.....	36	4	96	13	109	1.14
1951.....	37	8	142	24	166	1.29
1952.....	36	5	46	6	52	0.35
1953.....	32	4	86	15	101	0.56
1954.....	44	4	16	7	23	0.09
1955.....	40	7	156	21	177	0.75
1956.....	47	4	143	13	156	0.61
1957.....	43	3	31	2	33	0.11
1958.....	41	4	114	15	129	0.43
1959.....	57	8	198	28	226	0.65 a/

1/ Per 100 million passenger-miles flown.
a/ Passenger-miles estimated for 1959.

CIVIL AERONAUTICS BOARD
December 22, 1959

ACCIDENTS IN SCHEDULED INTERNATIONAL PASSENGER OPERATIONS
(Calendar Years 1938 - 1959 to Date)

Year	Accidents		Fatalities			Passenger Fatality Rate1/
	Total	Fatal	Passenger	Crew	Total	
1938.....	7	2	7	12	19	13.01
1939.....	6	1	10	4	14	12.77
1940.....	6	0	0	0	0	0
1941.....	4	1	2	0	2	1.20
1942.....	2	0	0	0	0	0
1943.....	2	1	10	4	14	3.93
1944.....	7	1	17	0	17	5.27
1945.....	5	2	17	10	27	3.67
1946.....	12	2	40	12	52	3.53
1947.....	9	3	20	13	33	1.07
1948.....	11	1	20	10	30	1.01
1949.....	8	0	0	0	0	0
1950.....	5	2	48	8	56	2.05
1951.....	10	1	31	9	40	1.13
1952.....	9	3	94	9	103	2.95
1953.....	5	2	2	0	2	0.05
1954.....	4	0	0	0	0	0
1955.....	5	1	2	2	4	0.04
1956.....	1	0	0	0	0	0
1957.....	7	1	36	8	44	0.60
1958.....	12	2	10	0	10	0.16
1959.....	9	1	59	9	68	0.81 2/

1/ Per 100 million passenger-miles flown.
2/ Passenger-miles estimated for 1959.

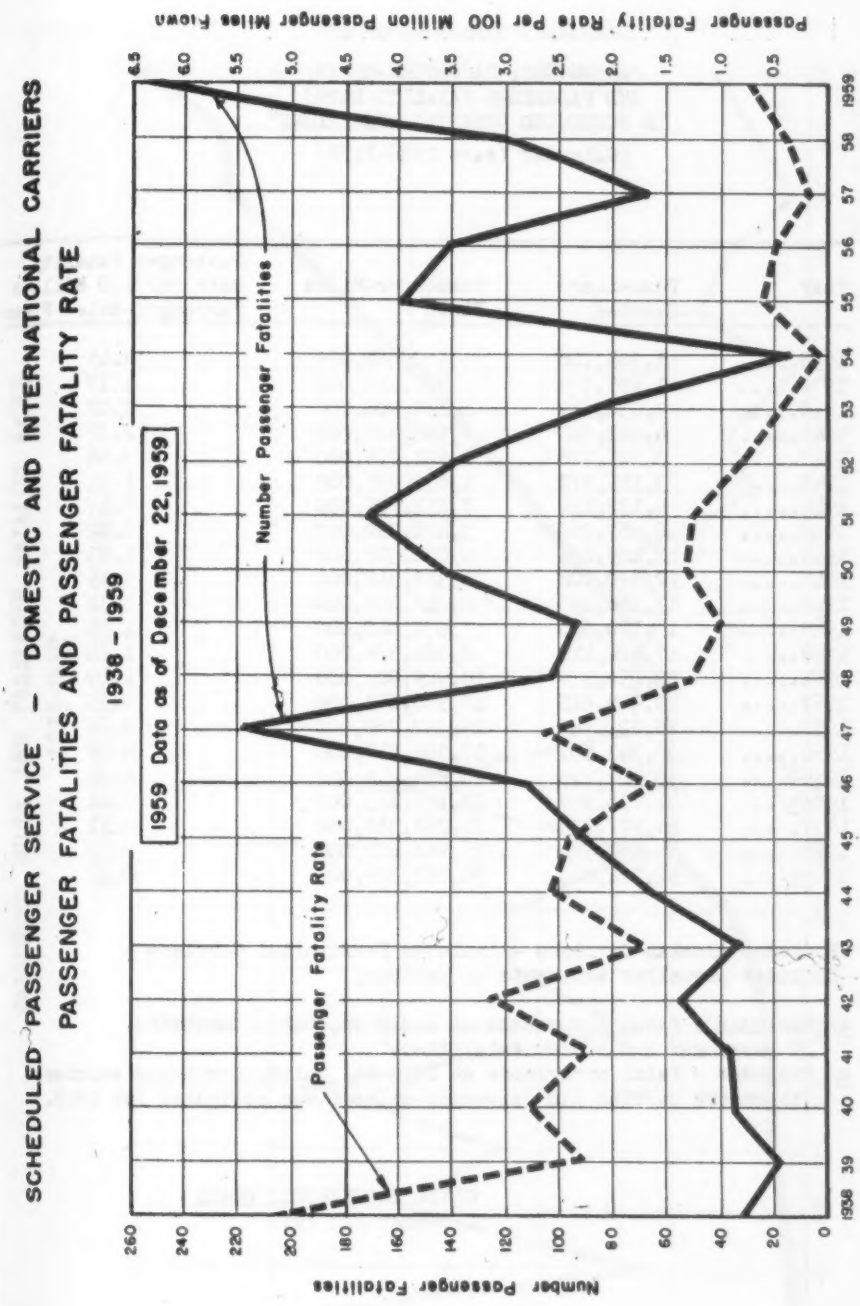
CIVIL AERONAUTICS BOARD
December 22, 1959

ACCIDENTS IN SCHEDULED DOMESTIC AND INTERNATIONAL PASSENGER OPERATIONS
(Calendar Years 1938 - 1959 to Date)

Year	Accidents		Fatalities			Passenger Fatality Rate 1/
	Total	Fatal	Passenger	Crew	Total	
1938.....	29	7	32	22	54	5.20
1939.....	33	3	19	7	26	2.28
1940.....	35	3	35	10	45	2.77
1941.....	30	5	37	9	46	2.21
1942.....	25	5	55	16	71	3.15
1943.....	16	3	32	12	44	1.66
1944.....	31	4	65	8	73	2.56
1945.....	38	9	93	21	114	2.40
1946.....	43	11	115	34	149	1.60
1947.....	45	8	219	30	249	2.67
1948.....	64	6	103	25	128	1.25
1949.....	37	4	93	11	104	1.00
1950.....	41	6	144	21	165	1.34
1951.....	47	9	173	33	206	1.26
1952.....	45	8	140	15	155	0.86
1953.....	37	6	88	15	103	0.46
1954.....	48	4	16	7	23	0.07
1955.....	45	8	158	23	181	0.62
1956.....	48	4	143	13	156	0.50
1957.....	50	4	67	10	77	0.20
1958.....	53	6	124	15	139	0.38
1959.....	66	9	257	37	294	0.68 a/

1/ Per 100 million passenger-miles flown.
a/ Passenger-miles estimated for 1959.

CIVIL AERONAUTICS BOARD
December 22, 1959


SCHEDULED PASSENGER SERVICE — DOMESTIC AND INTERNATIONAL CARRIERS
PASSENGER FATALITIES AND PASSENGER FATALITY RATE
1938 - 1959
1959 Data as of December 22, 1959
Number Passenger Fatalities
Passenger Fatality Rate
Number Passenger Fatalities
Passenger Fatality Rate Per 100 Million Passenger Miles Flown
0
20
40
60
80
100
120
140
160
180
200
220
240
260
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
1938
39
40
41
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43
44
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48
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51
52
53
54
55
56
57
58
1959

K

PASSENGERS, PASSENGER-MILES, AND PASSENGER FATALITY RATES IN SCHEDULED DOMESTIC OPERATIONS*

(Calendar Years 1938-1959)

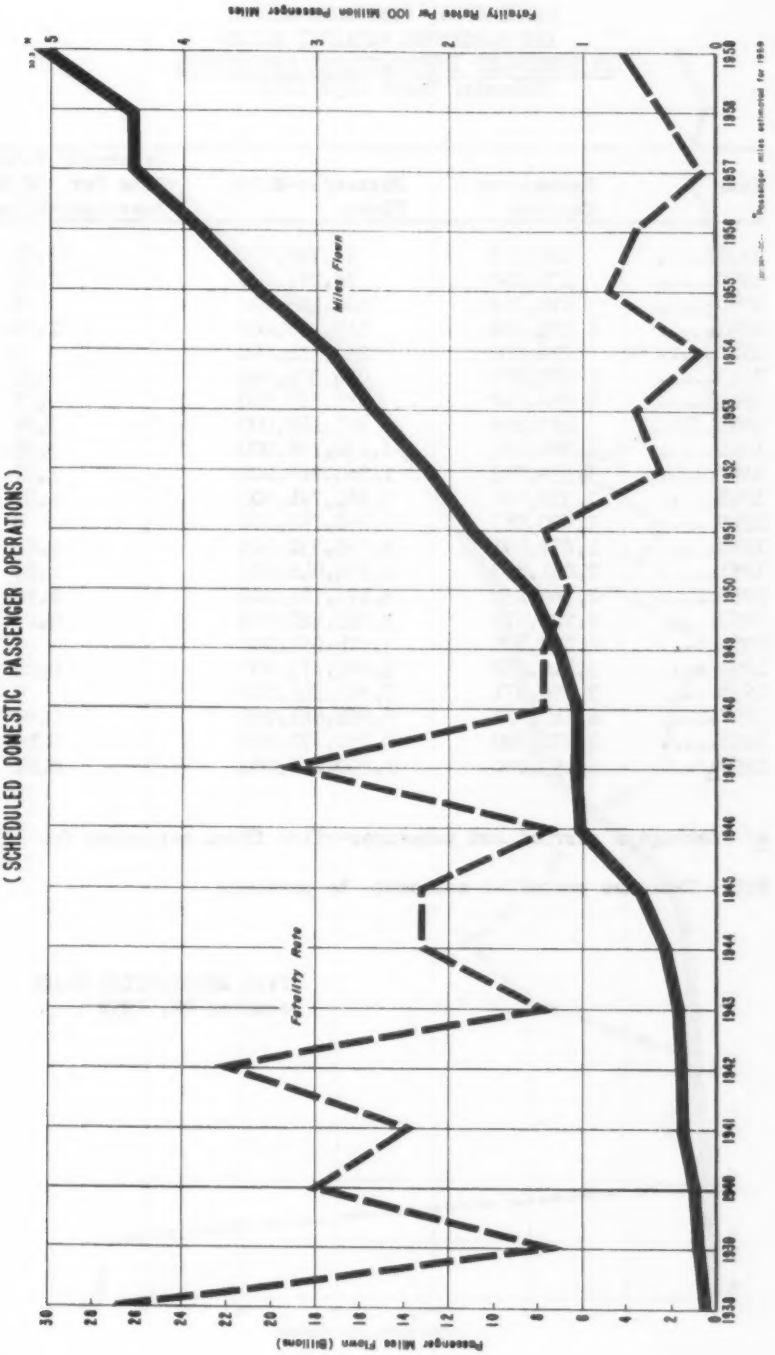
Year	Passengers Carried	Passenger-Miles Flown	Passenger Fatality Rate Per 100 Million Passenger-Miles Flown
1938.....	1,365,706	560,660,000	4.45
1939.....	1,895,793	755,118,000	1.19
1940.....	3,038,619	1,157,900,000	3.02
1941.....	4,141,748	1,506,303,000	2.32
1942.....	3,325,726	1,501,279,000	3.66
1943.....	3,115,972	1,670,935,000	1.31
1944.....	4,132,114	2,211,905,000	2.17
1945.....	6,687,968	3,408,290,000	2.22
1946.....	12,465,695	6,068,315,000	1.23
1947.....	12,890,208	6,313,312,000	3.15
1948.....	13,168,095	6,245,745,000	1.32
1949.....	15,120,015	7,071,042,000	1.31
1950.....	17,424,414	8,363,379,000	1.14
1951.....	22,652,179	10,949,903,000	1.29
1952.....	25,009,815	12,996,657,000	0.35
1953.....	28,722,743	15,337,760,000	0.56
1954.....	32,343,867	17,389,817,000	0.09
1955a/....	38,027,120	20,550,940,000	0.75
1956b/...	41,738,569	23,155,153,000	0.61
1957.....	44,972,334	26,252,338,000	0.11
1958.....	44,580,984	26,266,401,000	0.43
1959c/...	52,784,000	30,267,300,000	0.65

*Excludes Alaskan Carriers - Includes Territorial Carriers - Excludes propeller accidents to persons.

a/ Excludes - Fatal occurrence at Longmont, Colo. involving 39 passenger and 5 crew fatalities.
b/ Excludes - Fatal occurrence at Daggett, Calif. involving suicide.
c/ Passengers carried and passenger-miles flown estimated for 1959.

CIVIL AERONAUTICS BOARD
December 22, 1959

PASSENGER MILES AND PASSENGER FATALITY RATES
1938-1959
(SCHEDULED DOMESTIC PASSENGER OPERATIONS)


Fatality Rate Per 100 Million Passenger Miles
Passenger Miles Flown (Billions)
Miles Flown
Fatality Rate
*Passenger miles estimated for 1959

PASSENGERS, PASSENGER-MILES,
AND PASSENGER FATALITY RATES
IN SCHEDULED INTERNATIONAL OPERATIONS
(Calendar Years 1938-1959)

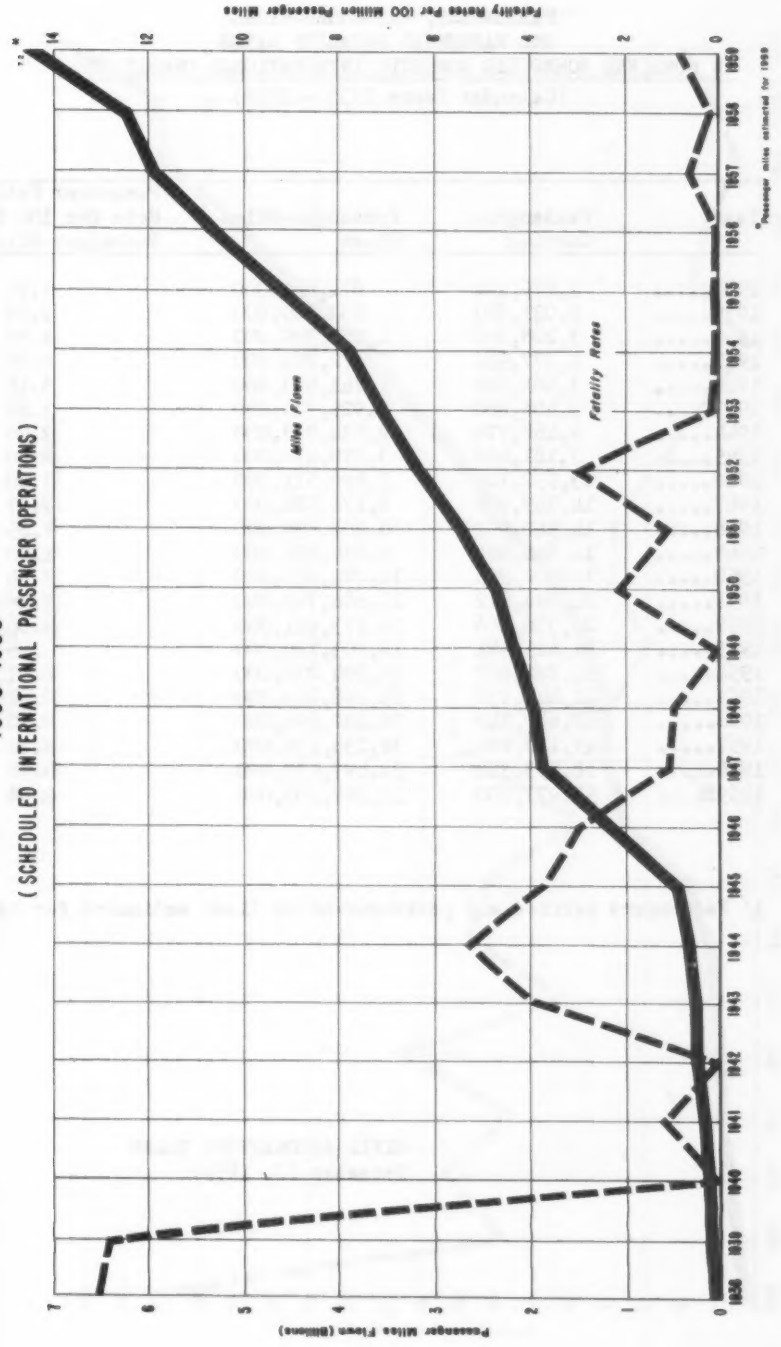
Year	Passengers Carried	Passenger-Miles Flown	Passenger Fatality Rate Per 100 Million Passenger-Miles Flown
1938.....	109,416	53,799,000	13.01
1939.....	136,090	78,271,000	12.77
1940.....	170,179	104,495,000	0
1941.....	235,802	165,950,000	1.20
1942.....	276,200	240,314,000	0
1943.....	292,888	254,374,000	3.93
1944.....	356,662	322,123,000	5.27
1945.....	493,498	462,180,000	3.67
1946.....	1,066,414	1,130,196,000	3.53
1947.....	1,359,712	1,863,268,000	1.07
1948.....	1,372,856	1,961,794,000	1.01
1949.....	1,520,067	2,168,780,000	0
1950.....	1,678,491	2,338,232,000	2.05
1951.....	2,041,833	2,734,846,000	1.13
1952.....	2,366,451	3,176,784,000	2.95
1953.....	2,702,678	3,565,420,000	0.05
1954.....	2,878,800	3,904,459,000	0
1955.....	3,416,652	4,601,273,000	0.04
1956.....	3,950,671	5,307,543,000	0
1957.....	4,147,937	5,981,841,000	0.60
1958.....	4,272,340	6,230,732,000	0.16
1959a/...	5,193,000	7,230,200,000	0.81

a/ Passengers carried and passenger-miles flown estimated for 1959.

Note: Excludes propeller accidents to persons.

CIVIL AERONAUTICS BOARD
December 22, 1959

PASSENGER MILES AND PASSENGER FATALITY RATES
1938-1959
(SCHEDULED INTERNATIONAL PASSENGER OPERATIONS)


Fatality Rates Per 100 Million Passenger Miles
Passenger Miles Flown (Billions)
Miles Flown
Fatality Rates
*Passenger miles estimated for 1959

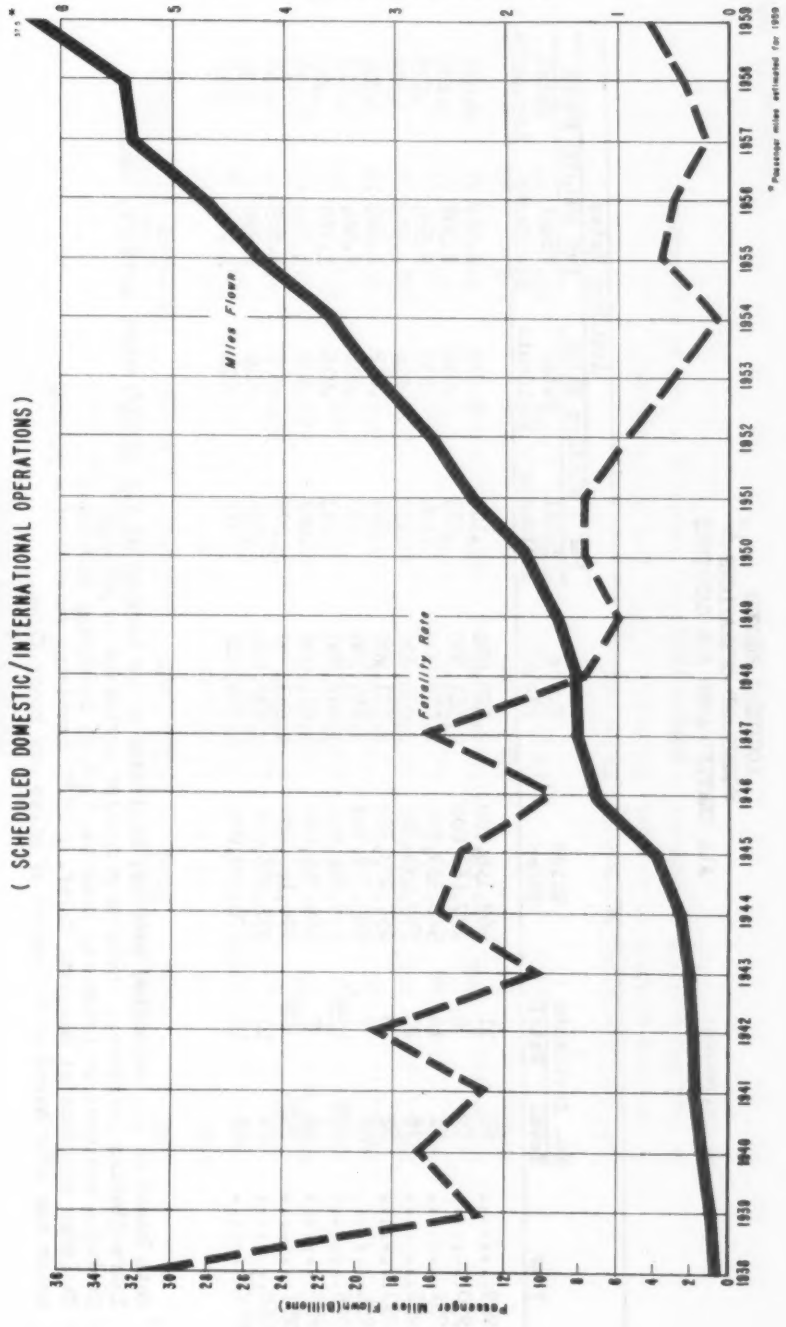
PASSENGERS, PASSENGER-MILES,
AND PASSENGER FATALITY RATES
IN COMBINED SCHEDULED DOMESTIC/INTERNATIONAL OPERATIONS
(Calendar Years 1938 - 1959)

Year	Passengers Carried	Passenger-Miles Flown	Passenger Fatality Rate Per 100 Million Passenger-Miles Flown
1938.....	1,475,122	614,459,000	5.20
1939.....	2,031,883	833,389,000	2.28
1940.....	3,208,798	1,262,395,000	2.77
1941.....	4,377,550	1,672,253,000	2.21
1942.....	3,601,926	1,741,593,000	3.15
1943.....	3,408,860	1,925,309,000	1.66
1944.....	4,488,776	2,534,028,000	2.56
1945.....	7,181,466	3,870,470,000	2.40
1946.....	13,532,109	7,198,511,000	1.60
1947.....	14,249,920	8,176,580,000	2.67
1948.....	14,540,951	8,207,539,000	1.25
1949.....	16,640,082	9,239,822,000	1.00
1950.....	19,102,905	10,701,611,000	1.34
1951.....	24,694,012	13,684,749,000	1.26
1952.....	27,376,266	16,173,441,000	0.86
1953.....	31,425,421	18,903,180,000	0.46
1954.....	35,222,667	21,294,276,000	0.07
1955.....	41,443,772	25,152,213,000	0.62
1956.....	45,689,240	28,462,696,000	0.50
1957.....	49,120,271	32,234,179,000	0.20
1958.....	48,853,324	32,497,133,000	0.38
1959a/...	57,977,000	37,497,500,000	0.68

a/ Passengers carried and passenger-miles flown estimated for 1959.

CIVIL AERONAUTICS BOARD
December 22, 1959

PASSENGER MILES AND PASSENGER FATALITY RATES
1938-1959
(SCHEDULED DOMESTIC/INTERNATIONAL OPERATIONS)


Fatality Rates Per 100 Million Passenger Miles
Passenger Miles Flown (Billions)
Miles Flown
Fatality Rate
*Passenger miles estimated for 1959

ACCIDENT RECORD
SCHEDULED OPERATIONS 1/
ALL CERTIFICATED AIR CARRIERS
1949 - 1959

Year	No. Accidents Total	No. Accidents Fatal	Miles Flown	Hours Flown	Accident Rates Per 1 Million Miles Total Accidents	Accident Rates Per 1 Million Miles Fatal Accidents	Accident Rates Per 100,000 Hours Total Accidents	Accident Rates Per 100,000 Hours Fatal Accidents
1949.....	66	11	463,198,100	2,520,000	0.142	0.023	2.619	0.436
1950.....	59	6	477,463,000	2,561,900	.123	.012	2.302	.234
1951.....	71	16	526,589,500	2,779,900	.134	.030	2.554	.575
1952.....	78	10	589,430,300	3,030,800	.132	.016	2.573	.329
1953.....	62	8	657,093,300	3,271,900	.094	.012	1.894	.244
1954.....	68	7	689,782,700	3,294,100	.098	.010	2.064	.212
1955.....	65a/	12a/	779,921,000	3,672,500	.083	.015	1.769	.326
1956.....	72	7	869,315,000	4,031,000	.082	.008	1.786	.173
1957.....	74b/	8b/	970,168,000	4,443,500	.075	.008	1.665	.180
1958.....	69	10	972,988,000	4,338,900	.071	.010	1.590	.230
1959c/.....	83	15	1,070,000,000	4,700,000	.077	.014	1.765	.319

1/ Data based on all scheduled service, including cargo service of all certificated carriers, including Intra-Alaskan carriers. Includes propeller accidents to persons.
a/ Excludes accident at Longmont, Colorado 11/1/55 involving sabotage.
b/ Excludes accident at Daggett, Calif. 7/25/57 involving suicide of a passenger.
c/ Rates for 1959 based on estimates of miles and hours flown.

CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY
December 22, 1959

ACCIDENT RECORD
IN THE
OVER-ALL REVENUE AND NONREVENUE OPERATIONS
OF THE
CERTIFICATED AIR CARRIERS
1949-1959

Year	Number of Accidents		Aircraft Miles Flown	Accident Rate Per 1 Million Miles Flown		Fatalities		
	Total	Fatal		Total Accidents	Fatal Accidents	Passengers	Crew	Others
1949.....	76	13	482,707,000	0.157	0.026	100	19	4
1950.....	73	9	501,778,000	.145	.017	148	25	3
1951.....	85	20	556,763,000	.152	.035	186	46	3
1952.....	95	12	618,960,000	.153	.019	176	21	19
1953.....	71	12	685,957,000	.103	.017	113	27	4
1954.....	81	8	719,550,000	.112	.011	16	12	3
1955.....	81[a]	15[a]	819,581,000	.098	.018	158	32	6
1956.....	96	9	948,183,000	.101	.009	156	18	0
1957.....	105[b]	13[b]	1,054,241,000	.099	.012	72	18	7
1958.....	85	15	1,045,439,000	.081	.014	128	27	5
1959.....	102	18	1,150,000,000[c]	.088	.015	270	59	9

Data includes propeller accidents to persons.

[a] Excludes accident at Longmont, Colorado, 11/1/55, involving sabotage.

[b] Excludes accident at Daggett, California, 7/25/57, involving suicide of a passenger.

[c] Estimated.

December 22, 1959

ACCIDENT RECORD
IN THE
OVER-ALL REVENUE AND NONREVENUE OPERATIONS
OF THE
NONCERTIFICATED AIR CARRIERS
1949-1959

Year	Number of Accidents		Aircraft Miles Flown	Accident Rate Per 1 Million Miles Flown		Fatalities		
	Total	Fatal		Total Accidents	Fatal Accidents	Passengers	Crew	Others
1949.....	20	9	23,473,000	0.852	0.383	104	16	6
1950.....	18	3	34,113,000	.527	.087	29	1	0
1951.....	24	5	44,732,000	.536	.111	78	12	0
1952.....	10	2	51,700,000	.193	.038	26	5	0
1953.....	22	8	48,937,000	.449	.163	142	27	1
1954.....	14	2	39,103,800	.358	.051	9	1	1
1955.....	13	3	43,206,000	.301	.069	27	5	1
1956.....	9	0	44,822,000	.201	.0	0	0	0
1957.....	8	1	35,486,000	.225	.028	0	2	0
1958.....	6	1	39,213,000	.153	.025	0	2	0
1959.....	10	1	N.A.	N.A.	N.A.	1	2	0

Data includes propeller accidents to persons.

N.A. - Miles flown in 1959 not available.

December 22, 1959

ACCIDENT RECORD
IN THE
OVER-ALL REVENUE AND NONREVENUE OPERATIONS
OF BOTH THE
CERTIFICATED AND NONCERTIFICATED CARRIERS
1949-1959

Year	Number of Accidents		Aircraft Miles Flown	Accident Rate Per 1 Million Miles Flown		Fatalities		
	Total	Fatal		Total Accidents	Fatal Accidents	Passengers	Crew	Others
1949.....	96	22	506,180,000	0.189	0.043	204	35	10
1950.....	91	12	535,891,000	.169	.022	177	26	3
1951.....	109	25	601,495,000	.181	.041	264	58	3
1952.....	105	14	670,720,000	.156	.021	202	26	19
1953.....	93	20	734,894,000	.126	.027	255	54	5
1954.....	95	10	758,654,000	.125	.013	25	13	4
1955.....	94a/	18a/	862,787,000	.108	.021	185	37	7
1956.....	105	9	993,005,000	.105	.009	156	18	0
1957.....	112b/	14b/	1,089,727,000	.102	.012	72	20	7
1958.....	91	16	1,08[illegible],652,000	.083	.014	128	29	5
1959.....	112	19	N.A.	N.A.	N.A.	271	61	9

Data includes propeller accidents to persons.

a/ Excludes accident at Longmont, Colorado, 11/1/55, involving sabotage.

b/ Excludes accident at Daggett, California, 7/25/57, involving suicide of a passenger.

N.A. -- Miles flown by noncertificated carriers not available.

NOTE: In 1957, a collision between a certificated and a noncertificated carrier carried as one accident in total figure.

December 22, 1959

ACCIDENT RATES COMPUTED ON BASIS OF HOURS FLOWN IN THE OVER-ALL REVENUE AND NONREVENUE OPERATIONS OF BOTH THE CERTIFICATED AND NONCERTIFICATED AIR CARRIERS

1954-1959

ACCIDENT RATES PER 100,000 HOURS FLOWN*

	Certificated Carriers		Noncertificated Carriers		Total Industry	
Year	Total Accidents	Fatal Accidents	Total Accidents	Fatal Accidents	Total Accidents	Fatal Accidents
1954.....	2.356	0.232	6.650	0.950	2.604	0.274
1955.....	2.090	.387	5.829	1.345	2.294	.439
1956.....	2.213	.207	3.906	.0	2.298	.197
1957.....	2.183	.270	4.259	.532	2.241	.280
1958.....	1.816	.320	3.181	.530	1.869	.328
1959.....	1.1994	.352	N.A.	N.A.	N.A.	N.A.

HOURS FLOWN IN OVER-ALL REVENUE AND NONREVENUE OPERATIONS*

Year	Certificated Carriers	Noncertificated Carriers	Total Industry
1954.....	3,437,200	210,500	3,647,700
1955.....	3,874,300	223,000	4,097,300
1956.....	4,337,100	230,400	4,567,500
1957.....	4,808,300	187,800	4,996,100
1958.....	4,678,500	188,600	4,867,100
1959.....	5,113,000	N.A.	N.A.

NOTE: Data includes propeller accidents to persons.

*Hours flown 1959 by certificated carriers computed on basis of actual figures for first three quarters and estimates for fourth quarter.

N.A. - Not available. Sufficient data not available to estimate number hours flown by noncertificated carriers.

December 22, 1959

N.A. - Not available. Sufficient data not available to compute rate. Rate not computed for aircraft flown by noncertificated carriers.

ACCIDENT AND ACCIDENT RATES
PER 100,000 HOURS FLOWN BY AIRCRAFT MAKE AND MODEL
IN OVERALL OPERATIONS OF CERTIFICATED AIR CARRIERS
(CALENDAR YEARS 1957, 1958, 1959)

AIRCRAFT	HOURS FLOWN			NUMBER OF ACCIDENTS						ACCIDENT RATE PER 100,000 HOURS FLOWN					
	1957	1958	1959 a/	1957		1958		1959		1957		1958		1959	
				Fatal	Total	Fatal	Total	Fatal	Total	Fatal	Total	Fatal	Total	Fatal	Total
B-377	116,842	105,325	90,000	1	3	1	4	0	3	0.86	2.57	0.94	3.79	0	3.33*
B-707	-	1,874	86,000	-	-	0	0	1	9	-	-	0	0	1.16*	10.46*
CV-240	244,164	321,900	148,200	1	1	1	4	0	3	0.41	0.41	.31	1.24	0	2.02
CV-340/440	407,240	247,836	388,200	0	3	0	4	0	2	0	0.74	0	1.61	0	0.51
CV-540	-	-	650	-	-	-	-	0	0	-	-	-	-	0	0
DC-3	726,935	687,229	729,500	2	12 b/	1	6	2	9	0.28	1.65	.14	.87	0.27	1.23
DC-4	288,420	198,522	193,400	1	8	0	1	2	3	0.35	2.77	0	.50	1.03	1.55
DC-6	387,310	354,087	355,800	0	3	0	2	0	4	0	0.77	0	.56	0	1.12
DC-6A	71,961	65,112	71,000	1	5	0	0	0	1	1.39*	6.95*	0	0	0	1.40*
DC-6B	500,212	536,129	587,900	0	5	0	6	0	4	0	1.00	0	1.11	0	0.68
DC-7	330,458	(636,235) c/	405,700	0	6	(1	8) c/	0	9	0	1.82	(.15	1.25) c/	0	2.21
DC-7B	134,161	( )	292,300	0	3	(	)	1	5	0	2.24	(	)	0.34	1.71
DC-7C	122,776	169,898	185,200	0	1	1	4	0	3	0	0.81	.58	2.35	0	1.61
DC-8	-	-	1,300	-	-	-	-	0	0	-	-	-	-	0	0
L-18	5,855	2,899	500	0	0	0	2	0	0	0	0	0	68.96*	0	0
L-049	154,283	121,300	110,000	0	4	0	0	1	1	0	0	0	0	0.90	0.90
L-649	219	-	-	0	0	-	-	-	-	0	0	-	-	-	-
L-749/749A	180,772	135,253	144,000	1 d/	5 b/	0	1	0	0	0.55	2.77	0	.73	0	0
L-1049/1049A	132,535	78,972	78,700	0	1	0	0	0	1	0	0.75	0	0	0	1.27*
L-1049C/1049D	66,163	48,906	48,800	0	0	0	3	0	0	0	0	0	6.13*	0	0
L-1049G	146,140	140,608	119,000	0	0	0	0	0	2	0	0	0	0	0	1.68
L-1049H	13,323	32,388	88,500	0	1	1	2	1	1	0	7.51*	3.09*	6.19*	1.12	1.12
L-1649A	40,070	93,510	101,000	0	0	0	3	1	1	0	0	0	3.20*	0.99	0.99
L-188	-	1,395	118,600	-	-	0	0	2	8	0	0	0	0	1.68	6.74
M-202/202A	47,996	77,313	35,000	0	0	0	2	1	1	0	0	0	2.58*	2.85*	2.85*
M-404	278,633	217,958	217,300	0	3	0	3	0	2	0	1.08	0	1.37	0	0.92
V-745	178,625	174,837	218,100	0	5	2	4	1	4	0	2.80	1.14	2.28	0.45	1.83
V-810/812	-	14,031	37,400	-	-	0	1	0	2	-	-	0	7.14*	0	5.34*
F-27	-	3,346	48,800	-	-	0	0	0	2	-	-	0	0	0	4.09*
C-46	164,624	139,798	130,200	1 d/	8	1	6	2	6	0.61	4.86	0.71	4.29	1.53	4.60
TOTAL	4,739,717	4,606,661	5,031,050	8	76 b/	9	66	15	86	0.17	1.60	0.19	1.43	0.29	1.70

NOTE: Data includes only fixed-wing aircraft over 12,500 pounds certificated gross weight.

Propeller accidents to persons are excluded.

* Rate based on exposure of less than index unit (100,000 hours).

a/ Hours flown based on figures for first 3 quarters and estimates for 4th quarter.

b/ Collision accident on ground between DC-3 and L-749 counted as one in total.

c/ DC-7 and DC-7B figures combined in 1958.

d/ No fatalities to occupants of aircraft. Fatalities occurred to person or persons on the ground.

CIVIL AERONAUTICS BOARD
December 23, 1959

COMPARISON OF ACCIDENT RECORD
OF TURBINE-ENGINE AIRCRAFT VS. PISTON-ENGINE AIRCRAFT
CERTIFICATED AIR CARRIERS
OVERALL OPERATIONS - 1959

Turbine Engine Aircraft	Number in Operation a/	Hours Flown b/	Number of Accidents		Accident Rate Per 100,000 Hours	
			Fatal	Total	Fatal	Total
B-707	47	86,000	1	9	1.16*	10.4*
DC-8	8	1,300	0	0	0	0
CV-540	1	650	0	0	0	0
L-188	76	118,600	2	8	1.68	6.74
V-745	67	218,100	1	4	0.45	1.83
V-810/812	15	37,400	0	2	0	5.34*
F-27	34	48,800	0	2	0	4.09*
Total	248	510,850	4	25	0.78	4.89

	Number Aircraft	Hours Flown	Accidents		Accident Rate Per 100,000 Hours	
			Fatal	Total	Fatal	Total
All Aircraft	1,861	5,031,050	15	86	0.29	1.70
Piston Engine	1,613(86%)	4,520,200(90%)	11(73%)	61(71%)	0.24	1.35
Turbine Engine	248(13%)	510,850(10%)	4(26%)	25(29%)	0.78	4.89

Note: Data excludes helicopters and small fixed-wing aircraft used in Alaskan operations. Propeller accidents to persons aboard are also excluded. * Rate based on exposures of less than index unit. a/ Reported as of September 30. b/ Based on figures for the first 3 quarters and estimates for the 4th quarter.

CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY
December 28, 1959

ACCIDENT RECORD OF NEW TYPE TRANSPORT AIRCRAFT DURING THE FIRST YEAR OF SCHEDULED AIR CARRIER SERVICE

Model	Make	Date of Entrance into Service	Date of First Fatal Accident	Accidents Total	Accidents Fatal
L-049	Lockheed	1/46	7/11/46	10	2
DC-6	Douglas	4/47	10/24/47	6	1
M-202	Martin	12/47	8/29/48	5	1
CV-240	Convair	3/48	1/22/52*	9	0
B-377	Boeing	4/49	2/11/50	4	1
DC-7	Douglas	1/54	6/30/56*	2	0
V-745	Viscount	9/55	4/6/58*	5	0
F-27	Fairchild	9/58	None	2	0
B-707	Boeing	10/58	8/15/59	8	2
L-188	Lockheed	1/59	2/3/59	8	2

* Not involved in fatal accident during first 12 months of operation.

LIST OF FATAL ACCIDENTS

Date	Location	Aircraft	Operator	Fatalities Passengers	Fatalities Crew
7/11/46	Reading, Pa.	L-049	TWA	0	5
12/28/46	Rineanna, Eire	L-049	TWA	9	4
10/24/47	Bryce Canyon, Utah	DC-6	UAL	47	5
8/29/48	Winona, Minn.	M-202	NWA	33	4
2/11/50	Central Islip, N.Y.	B-377	PAA	0	1
2/3/59	New York, N. Y.	L-188	AA	63	2
9/29/59	Buffalo, Texas	L-188	Braniff	27	7
8/15/59	Calverton, N. Y.	B-707	AA	0	5
10/19/59	Arlington, Wash.	B-707	Boeing	0	4

Civil Aeronautics Board
January 8, 1960

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PRELIMINARY REPORT
ACCIDENT TYPES AND OPERATIONAL PHASES OF FATAL
AIR CARRIER ACCIDENTS 1955-1959
(Scheduled Domestic/International Passenger Operations)

Accident Types and Operational Phase	1955	1956	1957	1958	1959	Total
Hard landing						
Level off				1		1
Overshoot						
Touchdown					1	1
Collision-Aircraft						
Both Airborne						
Normal cruise		1		2		3
Takeoff climb	1					1
Collision ground/water						
Initial climb		2	1			3
Normal cruise			1		1	2
Final approach	1		1	1	1	4
Collision rising terrain						
Climb to cruise altitude	1					1
Normal cruise	1					1
Final approach					2	2
Collision objects						
Final approach	2		1			3
Stall						
Final approach				1		1
Fire in flight						
Initial climb				1	1	2
Normal cruise	1					1
Engine tearaway						
Normal cruise	1					1
Disintegration in flight						
Normal cruise					3	3
Passenger opened cabin door						
Normal cruise		1				1
Total	8	4	4	6	9	31

Note: Excludes propeller accidents to persons.
Excludes Longmont, Colo. 11/1/55 and Daggett, Calif. 7/25/57.

Civil Aeronautics Board
January 8, 1960

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GENERAL AVIATION ACCIDENTS
CALENDAR YEAR 1959

FIXED-WING AIRCRAFT WEIGHING
MORE THAN 12,500 POUNDS

FATAL

DATE	LOCATION	AIRCRAFT
7/1/59	Marion, Ohio	Martin B-26, N 1502
8/9/59	Dravosburg, Pennsylvania	Lockheed L-18, N 6115A
12/17/59	Nr. Gravina, Alaska	PBY, N 64T

NON-FATAL

1/20/59	St. Louis, Missouri	Lockheed 18-08, N 25635
3/14/59	La Grande, Oregon	North American B-25, N 288G
4/22/59	Miami, Florida	Douglas B-26, N 9875C
4/26/59	Hyannis, Massachusetts	Lockheed Super PV-1, N 3031
5/5/59	Washington, D. C.	Fairchild F-27, N 994
5/7/59	San Antonio, Texas	Lockheed PV-1, N 539
5/13/59	Teterboro, New Jersey	Lockheed PV-1, N 711Z
5/15/59	Connorsville, Indiana	DC-3, N 21758
5/29/59	Atlanta, Georgia	DC-3, N 1C
6/20/59	Prescott, Arizona	Consolidated P4Y2, N 6884C
6/27/59	Puerto Vallarta, Mexico	Douglas DC-3, N 7401
7/7/59	La Grande, Oregon	North American B-25, N 9642C
7/9/59	Pittsburgh, Pennsylvania	Learstar Mark 1B, N 32L
7/19/59	Chino, California	Consolidated PBY, N 7082C
8/8/59	Shreveport, Louisiana	Douglas B-26, N 5181V
8/10/59	Fairbanks, Alaska	Grumman F7F, N 7628C
8/29/59	Portland, Oregon	Grumman F7F, N 7628C
10/8/59	Pittsburgh, Pennsylvania	Lockheed PV-1, N 340
10/26/59	Chicago, Illinois	Lockheed PV-1, N 33DT
11/5/59	Cleveland, Ohio	Douglas DC-3, N 38G
11/18/59	Los Angeles, California	Convair 440, N 102
12/11/59	Worcester, Massachusetts	Douglas DC-3, N 53
12/20/59	Catalina Island, California	Consolidated PBY, N 282K

Civil Aeronautics Board
December 29, 1959

GENERAL AVIATION ACCIDENTS
DECEMBER 31, 1958 and CALENDAR YEAR 1959

FIXED-WING AIRCRAFT WEIGHING
12,500 POUNDS OR LESS

FATAL

DATE	LOCATION	AIRCRAFT
12/31/58	Ft. Lauderdale, Florida	Cessna 180, N 1770C
1/1/59	Nr. Kyle, Texas	Piper PA-22, N 880C
1/1/59	Nr. Pontiac, Illinois	Cessna 190, N 3093B
1/3/59	Rosamond, California	Luscombe 8A, N 71987
1/3/59	Columbia, Missouri	Piper Comanche PA-24, N 5330P
1/11/59	Bishop, California	Aeronca Chief, N 26322
1/11/59	Boise, Idaho	Piper PA-20, N 7407K
1/11/59	Carlsbad, California	Harlow Interstate, N 37221
1/11/59	Lone Pine, California	Cessna 190, N 9839A
1/13/59	Anderson, Indiana	Beechcraft 35, N 465B
1/17/59	Redding, California	Cessna 170A, N 9171A
1/18/59	Wilsey, Kansas	Taylorcraft, N 23831N
1/25/59	Great Bend, Kansas	Cessna 170, N 2263D
*1/25/59	Atlanta, Georgia	Yellow Jacket (Experimental) N 54G
1/26/59	Nr. Lexington, Kentucky	Beechcraft 35D, N 2115B
1/27/59	Nr. Boise, Idaho	Piper PA, N 3281B
1/27/59	Carson City, Nevada	Piper Apache, N 5599P
1/27/59	Nr. Clayton, California	Howard, N 1177V
1/29/59	Gainesville, Florida	Cessna 140, N 76759
1/30/59	La Guardia Airport, New York	Cessna 182, N 2268G
1/30/59	Nr. Bakersfield, California	Beechcraft 34H, N 5407D
1/31/59	Greenville, South Carolina	Navion, N 2775A
1/31/59	Hartford, Wisconsin	Piper PA-12, N 92756
2/1/59	Buena Park, California	Piper Clipper, N 58518 and Luscombe 8A, N 1887B
2/2/59	Sacramento, California	Piper Apache, N 5599
2/3/59	Nr. Mason City, Iowa	Beechcraft 35, N 3794N
2/3/59	Mountain View, Oklahoma	Piper, N 1503N
2/6/59	Oakland, California	Beechcraft 35E, N 7321B
2/6/59	Eugene, Oregon	Stinson 108, N 896C
2/6/59	Kerrville, Texas	Mooney M20, 4PCLM
2/8/59	Half Moon Bay, California	Cessna 140, N 1905V
2/8/59	Nr. Flagstaff, Arizona	Navion, N 7243C
2/8/59	McDonald, Pennsylvania	Aeronca 7AC, N 9875B
*2/8/59	Nr. Vicksburg, Mississippi	Piper PA-18A, N 8080D
*2/8/59	Leach Lake, Minnesota	Cessna 180, N 3303D
2/8/59	Jacksonville, Florida	Twin Bonanza, N 4952B
2/13/59	Denver, Colorado	Piper PA-20, N 7094K
2/13/59	Delray Beach, Florida	Cessna 172, N 7179A
2/16/59	Lock Haven, Pennsylvania	Piper (Experimental), X4520P

* Assigned to FAA for investigation

DATE	LOCATION	AIRCRAFT
2/16/59	Palmdale, California	Taylorcraft, N 48546
2/18/59	Flag Pond, Tennessee	Skimmer Amphibian, N 244B
2/18/59	Tracy City, Tennessee	Navion, N 5125K
2/18/59	Parkersburg, West Virginia	Cessna 180, N 9196C
2/20/59	Signal Peak, Texas	Swift, N 3341K
2/20/59	Nr. Livermore, California	Cessna 182, N 6179B
2/20/59	Cowley, Wyoming	Piper, N 78577
2/21/59	Lincoln, New Hampshire	Piper Comanche, N 5324P
2/22/59	Anchorage, Alaska	Piper PA-11, N 78790
2/22/59	Kankakee, Illinois	Beechcraft 35, N 8169D
2/23/59	Danbury, Connecticut	Piper Comanche, N 5572P
2/25/59	Kissimmee, Florida	Piper Tri-pacer, N 3912
2/28/59	Leola, Arkansas	Beechcraft T-34, N 7834H
2/28/59	West Cross Plain, Wisconsin	Piper Vagabond, N 4336H
*2/28/59	Jessup, Georgia	Cessna 175, N 7171M
*3/3/59	Southmont, North Carolina	Navion, N 9470K
3/4/59	Detroit, Michigan	Mooney MK20A, N 6554B
3/6/59	Brockton, Montana	Piper Tri-pacer, N 7620D
3/7/59	Macomb, Illinois	Taylorcraft, N 36223
3/11/59	Arthur, Iowa	Cessna 172, N 8615B
3/12/59	Annville, Pennsylvania	Piper Apache PA-23, N 1399P
3/14/59	Charlotte, North Carolina	Beech Bonanza, N 8411A
3/14/59	Nr. Steinhatchee, Florida	Cessna, N 3539D
3/16/59	Greencastle, Indiana	Piper Pacer, N 2632A
3/17/59	Wellington, Collingsworth County, Texas	Cessna 175, N 7157M
3/20/59	Dahlonega, Georgia	Cessna 172, N 7938
3/21/59	Oceanside, California	Luscombe Phantom, N 1265
3/22/59	Dallas, Texas	Aeronca 7AC, N 84526
3/23/59	En route to Seattle, Washington	Mooney, N 6585B
3/24/59	San Antonio, Texas	Twin Bonanza E-50, N 4361K
3/25/59	Hayti, Missouri	Aeronca, N 39310
3/25/59	Nr. Pahokee, Florida	Piper PA-18A, N 7177B
3/25/59	En route to Redmond, Oregon	Piper Comanche, N 5513P
3/26/59	Illiopolis, Illinois	North American SNJ, N 7060C
3/26/59	Tamiami, Florida	Aeronca 7FC, N 9083B and Cessna 150, N 5502E
3/26/59	Livermore, California	Beechcraft T-34, N 5072K
*3/27/59	Des Arc, Arkansas	Stearman A7-NL, N 64904
3/29/59	Carlsbad, New Mexico	Piper PA-18A, N 9087D
3/29/59	Minneapolis, Minnesota	Aeronca 7AC, N 2925E
3/29/59	Ketchikan, Alaska	Stinson Station Wagon, N 6479M
3/31/59	Jollyville, Texas	Cessna 180, N 4712B
*3/31/59	Nr. Wetumpka, Alabama	Beechcraft Stagger Wing, N 19474

* Assigned to FAA for investigation

DATE	LOCATION	AIRCRAFT
4/1/59	Nr. Enid, Oklahoma	Piper PA-18, N 7583D
4/2/59	Alpharetta, Georgia	Cessna 182, N 2608G
4/3/59	Chandalar, Alaska area	Piper, N 1114C
*4/4/59	Nr. Graber, Oklahoma	Piper PA-18, N 7695D
4/4/59	Rockford, Illinois	Piper J3, N 6062V
4/4/59	Dallas, Texas	Bellanca Cruisemaster, N 523A
4/4/59	Yuba, Oklahoma	Piper J3, N 26709
4/4/59	Lenoir, North Carolina	Piper Tri-pacer, N 7315K
4/6/59	Ponca City, Oklahoma	Piper PA-18A, N 3985P
4/6/59	Fox Hollow, Virginia	Piper PA-18, N 1676P
4/8/59	Fairbanks, Alaska	Piper PA-20, N 1102C
4/10/59	Between Matagorda Island and Seadrift, Texas	Piper PA-18, N 1395A
4/11/59	North Crest of Manulique Pass between Monterey, Mexico and San Antonio, Texas	Stinson L-5, N 59627
4/11/59	Quila, Sinaloa, Mexico	Beech Bonanza 35, N 4568V
4/12/59	Nr. Andytown, Florida	Republic Seabee Amphibian, N 6284K
4/12/59	Visalia, California	Fairchild 24, N 81301
4/13/59	Mayville, Wisconsin	Ercoupe, N 86976
4/15/59	Nr. London Hill, Virginia	Fairchild 62A, N 46437
4/16/59	Newkirk, Oklahoma	Stearman Duster, N 60417
4/17/59	Nr. Syracuse, Indiana	Mooney Mark 20, N 5276B
4/18/59	Biggs, California	Boeing A75N1, N 9750H
4/18/59	Meridian, California	Stearman, N 26352
4/18/59	Bailey Ridge, California	Cessna 140, N 89604
4/19/59	Lantana, Florida	Phillips-Powers Miles Sparrow Hawk M-5, N 191M
4/20/59	En route Asbury Park, New Jersey	Piper Pacer, N 7480F
4/23/59	West Dover, Vermont	Stearman, N 60085
4/25/59	Nucla, Colorado	Piper PA-11, N 78724
4/26/59	Nr. La Canada, California	Aeronca, N 2403E
4/27/59	Chocowinity, North Carolina	Piper J3, N 2032M
4/28/59	Temple, Oklahoma	Taylorcraft, N 5122N
4/28/59	Nr. Alexandria, Louisiana	Beechcraft Bonanza, N 5580D
5/1/59	Stuttgart, Arkansas	Piper PA-18A, N 8572D
5/1/59	Nr. Dillon, Montana	Cessna 182, N 5984B
5/2/59	Kokomo, Indiana	Cessna 140, N 89755
5/2/59	Halfday, Illinois	Beech Bonanza 35B, N 8886A
5/2/59	Mammoth Mountain, California	Piper PA-24, N 5615P
5/3/59	Franklin, Indiana	Piper Tri-pacer PA-22, N 8410D
5/6/59	Nr. Sikeston, Missouri	Piper PA-12, N 3387M
5/9/59	Nr. Scotsburg, Oregon	Piper Apache, N 3459P
5/10/59	Milo, Maine	Taylorcraft with floats, N 36008
5/10/59	Nr. El Centro, California	Beech Bonanza F-35, Mexican Registration XB-DOA

* Assigned to FAA for investigation

DATE	LOCATION	AIRCRAFT
5/11/59	Knights Landing, California	Piper PA-18A, N 2778P
5/11/59	Wautoma, Wisconsin	Cessna 310, N 2604C
5/12/59	Nr. Phoenix, Arizona	Luscombe 8D, N 39065
5/12/59	Jamaica, New York	Taylorcraft, N 36008
*5/13/59	Nr. Biglerville, Pennsylvania	Cessna 180, N 4605A
5/14/59	Nr. Ray, Arizona	Piper, N 1049
5/15/59	Coulee City, Washington	Piper Tri-pacer, N 1844A
5/16/59	Stanislaus National Forest, California	Aeronca Champion, N 4541E
5/17/59	Nr. Wheelerville, Missouri	Piper PA-22, N 3828P
5/17/59	San Carlos, California	Cessna 175, N 7507M
5/17/59	Medford, Wisconsin	Cessna 120, N 89472
5/17/59	Yakima, Washington	Piper PA-12, N 3538M
5/17/59	Nr. Macon, Missouri	Piper Tri-pacer, N 8769D
5/18/59	Indianola, Mississippi	Piper PA-18A, N 7862D
5/20/59	Nr. Milan, Georgia	Fairchild 24, N 81245
5/20/59	Plainville, Connecticut	Aeronca 7AC, N 2743E
5/21/59	Teggau Lake, Ontario, Canada	Piper PA-18, N 9081D
5/23/59	Columbia, Missouri	Aeronca 7AC, N 4423E
5/23/59	Corinne, Oklahoma	Cessna 172, N 5732A
5/25/59	Nr. Charleston, South Carolina	Cessna 170, N 9022A
5/25/59	Sahuarita, Arizona	Aeronca Sedan, N 1327H
5/27/59	Newburyport, Massachusetts	Beechcraft T-34, N 10126
*5/27/59	Nr. Coaldale, Colorado	Cessna 195, N 1084D
5/28/59	Caldwell, Kansas	Cessna 195, N 1089D
5/28/59	Nr. Bennington, Oklahoma	Champion Sky-Trac 7GC, N 4880E
5/28/59	Madras, Oregon	Piper PA-18, N 8963C
5/28/59	Nr. West Palm Beach, Florida	Beechcraft Bonanza, N 784B
5/29/59	Foxboro, Massachusetts	Taylorcraft DC-12, N 36005
5/29/59	Nr. Haxtun, Colorado	Mooney Mark 20A, N 1086C
5/29/59	Barnesville, Minnesota	Piper PA-11, N 78688
5/30/59	Mauston, Wisconsin	Navion, N 8548H
*5/30/59	Immokalee, Florida	Cessna 150, N 5660E
5/31/59	Oak Creek, Wisconsin	Piper PA-16, N 5635H
5/31/59	Nr. Chester, Montana	Callair A5, N 6043C
5/31/59	Ogden, Utah	Twin Navion, N 106N
5/31/59	Nr. Great Falls, Montana	Aeronca 15 AC, N 1176H
6/1/59	Sugarland, Texas	Cessna 172, N 4098F
6/1/59	Villa Rica, Georgia	Cessna 140A, N 5616C
6/2/59	Carrollton, Georgia	Cessna 140A, N 5616
6/2/59	Hendersonville, North Carolina	Beechcraft T-34, N 2777A
6/3/59	Oceanside, California	Beech Bonanza, N 6789D
6/4/59	Hartley, Iowa	Cessna 140, N 2967N
6/4/59	Nr. Hoven, South Dakota	Piper J3, N 42952
6/5/59	Nr. St. Clair, Missouri	Piper PA-12, N 9671L
6/5/59	Ten Sleep, Wyoming	Callair A5, N 8859C

* Assigned to FAA for investigation

DATE	LOCATION	AIRCRAFT
6/6/59	Marinette, Wisconsin	Aeronca Champion 7CCM, N 45595
6/7/59	Mansfield, Ohio	Taylorcraft, N 44499
6/7/59	Quartz Hill, California	Cessna 172, N 6138E
6/10/59	Houston, Texas	Cessna 170, N 2610V
6/11/59	Dublin, Georgia	Piper PA-11, N 4777M
6/11/59	Standish, Michigan	Piper PA-22, N 4405A
6/12/59	South Charleston, Ohio	SNJ5, N 3688F
6/14/59	Dallas Center, Iowa	Beechcraft 35, N 3982N
6/14/59	Nr. Portland, Oregon	Culver Cadet, N 29381
6/15/59	Gainesville, Texas	Converted Mustang S51, N 7712C
6/16/59	Nr. Yukon, Oklahoma	Piper PA-18, N 10439
*6/16/59	Sleetmute, Alaska	Cessna 180, N 9143C
6/17/59	Levelock, Alaska	Taylorcraft N 96084
*6/17/59	Sinton, Texas	Piper J3, N 3689K
6/17/59	Britton, South Dakota	Aeronca Champion 7CC, N 8505E
6/17/59	Nr. Hickory Ridge, Arkansas	Piper PA-18, N 4373A
6/22/59	Cloudcroft, New Mexico	Stinson 150, N 97321
*6/23/59	Thatcher, Idaho	Aeronca 7AC, N 1238E
6/25/59	Spanish Fork, Utah	Cessna 172, N 341C
6/25/59	Damariscotta, Maine	Piper J3C, N 42189
6/26/59	Nr. Superior, Wisconsin	Cessna 172, N 6002A
*6/26/59	Rayland, Ohio	Cessna 182, N 6396A
*6/26/59	Nr. Clairton, Pennsylvania	Navion, N 5224K
6/28/59	Nr. Hart, Texas	Fairchild M62C, N 61652
6/28/59	Bass Lake, California	Luscombe 8A, N 25116
6/29/59	Nr. Taberg, New York	Ryan 2TA, N 17367
6/29/59	Nr. Minot, North Dakota	Aeronca 7AC, N 2415E
7/1/59	Nr. Austin, Texas	Stearman Sprayer, N 52139
7/2/59	Nr. Republic, Missouri	Beechcraft Twin Bonanza, N 4368D
7/2/59	Hanson, Massachusetts	Piper, N 2614N
7/3/59	Nr. Cocoa, Florida	Ercoupe, N 99054
7/4/59	Augusta, Wisconsin	Luscombe 8, N 20662
7/4/59	Nr. St. Marys, Georgia	Cessna 172, N 6305E
7/4/59	Nr. Jerome, Arizona	Piper Tri-pacer, N 2420P
7/5/59	Williamsport, Pennsylvania	Vultee BT-13, N 69106
7/5/59	Wichita, Kansas	Piper PA-12, N 7629H
*7/5/59	Nr. Owensville, Ohio	Beechcraft Bonanza, N 715
7/5/59	Nr. Minton, California	Martin TBM, N 9830C
7/5/59	En route to Fort Lauderdale, Florida	Beechcraft Bonanza, N 1899D
*7/6/59	Yellow Springs, Ohio	Cessna 182, N 2689G
7/7/59	Nr. Altus, Oklahoma	Piper PA-18A, N 7095D
7/8/59	Johannesburg, California	North American AT-6, N 3188C
7/9/59	Nr. Gorman, California	Stearman PT-17, N 67212
7/10/59	Nr. Nyssa, Oregon	Piper PA-18A, N 7285D
7/11/59	Nr. Huntington Beach, California	Stitts GF-1, N 91P
7/11/59	Nr. Galax, Virginia	Taylorcraft BC-12D, N 96826

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DATE	LOCATION	AIRCRAFT
7/12/59	Nr. Wauseon, Ohio	Fairchild 24, N 22033
7/12/59	Durango, Colorado	Beechcraft 18, N 286K
7/13/59	Nr. Gap, Arizona	Cessna 180, N 5175E
7/14/59	Mooring, Texas	Piper J-5, N 33280
7/17/59	Hanna, Utah	Cessna 182, N 2111
7/17/59	Nr. McClelland, Arkansas	Piper PA-18A, N 7364D
*7/17/59	Nr. Carbondale, Colorado	Piper PA-18, N 2505P
7/18/59	Nr. Baird, Texas	Beech Bonanza 35G, N 4209D
7/18/59	Clanton, Alabama	Beechcraft 35D, N 2951B
7/18/59	Nr. Muskegon Heights, Michigan	Cessna 140, N 5662C
7/18/59	Philadelphia, Pennsylvania	Luscombe, N 2325K
7/19/59	Barter Island, Alaska	Cessna 180, N 744
7/20/59	Nr. Lupton, Colorado	Boeing A-75, N 4427N
7/21/59	Wilsall, Montana	Cessna 180, N 7396C
7/22/59	Hearne, Texas	Boeing Stearman, N 60196
7/25/59	Nr. Calipatria, California	Stearman, N 56433 and Stearman, N 4671N
7/25/59	Capistrano, California	Cessna 180, N 1784C
7/25/59	Groveland, California	Cessna 180, N 3124C
7/26/59	Branson, Missouri	Cessna 175, N 9337B
7/26/59	Middle Fork, Salmon River, Idaho	Piper PA-24, N 59F
7/26/59	Petersburg, Ohio	Waco UPF7, N 32171
7/26/59	Newark, Ohio	Beechcraft A-35, N 8696C
7/29/59	Nr. Rogers, Texas	Stearman E-75, N 4583N
7/30/59	Anoka, Minnesota	Cessna T-50, N 9511H
8/1/59	Troy, Oregon	Aeronca, N 85535
8/1/59	Okmulgee, Oklahoma	Beech Bonanza, N 3821N
8/2/59	Bodega Bay, California	Piper Tri-pacer PA-22, N 8100C
8/2/59	Pontiac, Michigan	Piper Tri-pacer, N 2283A
8/2/59	Amarillo, Texas	Parker Johnson Glider, N 68731
8/2/59	Lyford, Texas	Piper PA-18, N 8155C
8/3/59	Zanesville, Ohio	Cessna 172, N 8835B
8/3/59	Ronkonkoma, L. I., New York	Globe Swift GC-13, N 934
8/3/59	Asheville, North Carolina	Stinson Voyager, N 97921
8/4/59	Moose Creek, Montana	Ford Trimotor, N 8419
8/5/59	Delaware Bay, New Jersey	Piper PA-22, N 76050
8/7/59	Logansport, Indiana	Piper Apache, N 2605
8/7/59	Walworth, Wisconsin	Cessna 182, N 5090D
8/7/59	Auburn, California	Swift, N 3355K
8/8/59	Lompoc, California	Stinson 108-2, N 9522K
8/9/59	Bakersfield, California	Experimental Home-made Glider, N 6834C
8/10/59	Calgary, Alberta, Canada	Piper PA-22, N 2160A
8/13/59	Auburn, Alabama	Cessna 170, N 3080A
8/13/59	Winston-Salem, North Carolina	Piper J3, N 30964

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DATE	LOCATION	AIRCRAFT
8/14/59	Van Nuys, California	Beech Bonanza 35, N 3846N
*8/14/59	Ocala, Florida	Aeronca, N 36525
8/14/59	Teslin, Yukon, Canada	Piper PA-18, N 7761D
8/15/59	Augusta, Maine	Piper J3, N 41247
8/15/59	Farwell, Texas	Piper PA-24, N 5579P
8/15/59	Lake Timagami, Ontario, Canada	Piper J3C-65, N 3563N
8/16/59	Sammanish Lake, Washington	Aeronca Sedan, N 1248H
8/16/59	Cherry Tree, Pennsylvania	Aeronca 7AC, N 2431E
8/17/59	Durham, North Carolina	Stinson 10A, N 36720
*8/17/59	West Palm Beach, Florida	Cessna 170, N 3971F
8/19/59	Anchorage, Alaska	Stinson JR-SR, N 13458
8/19/59	Port Graham, Alaska	Taylorcraft, N 9699T
8/20/59	Newport, Oregon	Mooney Mark 20, N 8183E
8/21/59	Martin, Ohio	Piper PA-18, N 7370D
8/21/59	Land O'Lakes, Wisconsin	Piper Comanche, N 5225P
8/21/59	Duxbury, Minnesota	Cessna 170, N 3993V
8/22/59	Mio, Michigan	Mooney M-20, N 5232B
8/24/59	Morehead City, North Carolina	Piper PA-18, N 1567P
8/24/59	Mangum, Oklahoma	Piper PA-18, N 8482D
8/25/59	South Sandwich, Illinois	Taylorcraft, N 39921
8/26/59	Norfolk, Virginia	Piper Cruiser, N 92514 and Piper Super Cruiser, N 3203M
8/26/59	Gallup, New Mexico	Piper PA-18, N 28702
8/26/59	Cassville, Wisconsin	Piper Tri-pacer, N 7154B
8/29/59	Compton, California	Interstate S1A, N 37378
8/30/59	Plymouth, Indiana	Cessna 172, N 7144A
8/31/59	McLeansboro, Illinois	Piper Tri-pacer, N 1513P
9/1/59	Wake Island	Beechcraft 18A, N 2094C
9/1/59	Crawford, Ohio	Cessna 180, N 1673C
9/1/59	Ophir, Alaska	Beechcraft C-18, N 53179
9/2/59	Rohwer, Arkansas	Piper J3, N 32628
9/2/59	Mt. Rainier, Washington	Cessna 140, N 76749
9/3/59	Lemars, Iowa	Fairchild M62A, N 50301
9/4/59	Sherrill, Arkansas	Piper PA-18-135, N 8854C
*9/4/59	Nr. Meridian, Idaho	Stinson 108, N 6536M
9/5/59	Hadley, Massachusetts	Aeronca 7AC, N 85017
9/5/59	Nr. Newburg, Oregon	Cessna 180, N 1726C
9/5/59	Ranger Lake, Ontario, Canada	Piper PA-18, N 9915
9/6/59	Nr. Red Cloud, Nebraska	Piper PA-22, N 8721D
9/6/59	Nr. Ocala, Florida	Cessna 172, N 7192M
9/7/59	Nr. Butler, Pennsylvania	Mooney Mite, N 4174
9/7/59	Kernville, California	Republic Seabee, N 6367K
9/7/59	East Poplar, Saskatchewan, Canada	Cessna 182, N 6190B
9/8/59	Fort Morgan, Alabama	Taylorcraft BL, N 29569
9/9/59	Otterbein, Indiana	Beech Bonanza, N 3773N

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DATE	LOCATION	AIRCRAFT
*9/10/59	East Fork of Little Delta River, Alaska	Piper PA-18, N 7288K
9/11/59	Sewannee, Tennessee	Beechcraft Bonanza, N 5013C
9/12/59	Spokane, Washington	Taylorcraft BC12-D, N 95780
9/13/59	Taft, California	Stearman, N 68496
*9/13/59	Cottonport, Louisiana	Ryan PT19, N 29006
9/13/59	Crestline, Ohio	Luscombe, N 71588
9/13/59	Nr. State Line, Mississippi	Piper PA-23, N 3087P
9/13/59	Tahoe, California	Vultee BT-13, N 67078
*9/16/59	Colt, Arkansas	Boeing Stearman, N 64558
9/17/59	Nr. Livingston Manor, New York	Piper J3, N 41435
9/18/59	Fort Pierce, Florida	Piper PA-11, N 4978 and Cessna 172, N 8744B
9/18/59	Nr. Crenshaw, Mississippi	Piper PA-18, N 1995A
9/18/59	Nr. Lakeville, Minnesota	Piper Comanche, N 5667P
9/19/59	Nr. Waco, Texas	Cessna 172, N 3930B
9/19/59	Nr. Gould, Arkansas	Piper J3, N 6211
9/19/59	Nr. Nelsonville, Ohio	Cessna 140, N 76492
9/20/59	Nr. Saranac Lake, New York	DeHaviland Otter NX, N 60D
9/20/59	Indiana, Pennsylvania	Piper Apache PA-23, N 1341P
9/20/59	Tahoe, California	Bellanca 14-13, N 86825
9/20/59	Birchwood, Alaska	Piper PA-20, N 3623A
9/24/59	Spokane, Washington	Cessna 170, N 1922C
9/25/59	Nr. St. Paul, Minnesota	Piper Comanche, N 5918P
9/25/59	Nr. Arma, Kansas	Cessna 182B, N 2671G
9/27/59	Nr. La Porte, Indiana	Home Made Experimental Racer, N 1306V
9/29/59	Nr. Delhi, Louisiana	Piper PA-18A, AMB Nicaraguan Registry
9/29/59	Nr. Neillsville, Wisconsin	Swift, N 2367B
9/30/59	Philadelphia, Pennsylvania	Aeronca L-16, N 9330H and Cessna 140, N 1652V
9/30/59	Martin, South Dakota	Piper J3C-65, N 6698H
10/1/59	Patzau, Wisconsin	Cessna 180, N 5227D
10/3/59	Scullin, Oklahoma	Piper PA-22, N 3730A
10/4/59	Chihuahau, Mexico	Piper Super Cub, N 75348
10/5/59	Nr. Calvary, Georgia	Piper J3, N 21873
10/5/59	Nr. Nipomo, California	Aeronca, N 84277
*10/6/59	Tonki Cape, Kodiak, Alaska	Aeronca Sedan, N 1474H
10/7/59	Nr. Pima, Arizona	Piper PA-18, N 2423A
10/8/59	Lecontes Mills, Pennsylvania	Cessna 182, N 2229G
10/10/59	Nr. Clinton, Missouri	Mooney Mark 20A, N 1093B
10/10/59	Douglas, Kansas	Cessna 182, N 7900B
10/10/59	Dunkirk, Indiana	Cessna 170, N 3432D
10/10/59	Nr. Pleasant View, Illinois	Piper PA-22, N 1820P
10/13/59	Nr. Jonesville, Michigan	Cessna 172, N 7389A

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DATE	LOCATION	AIRCRAFT
10/13/59	Halsey, Nebraska	Piper J3, N 20871
10/13/59	Liberal, Kansas	Mooney M20A, N 08305
10/16/59	Fountain Valley, California	Navion, N 4440K
*10/16/59	Crystal River, Florida	Piper Apache PA-23, N 3247P
10/17/59	New Market, New Jersey	Piper PA-22, N 2652A
10/17/59	Nr. Eloy, Arizona	Stearman, N 3958B
10/17/59	Sacramento, California	Ryan St-3KR
10/18/59	Nr. Leone, Kansas	Luscombe, N 1660K
10/24/59	Nr. Concord, California	Piper PA-12, N 4318M
10/25/59	Hesperia, California	Mooney Mark 20A, N 1065C
10/25/59	Hiawatha, Kansas	Aeronca 7AC, N 83545
10/30/59	Nr. Waco, Tennessee	Piper PA-18, N 10559
10/30/59	Nr. Crestwood, Kentucky	Cessna 172, N 8237B
10/30/59	Nr. Desert Center, California	Bonanza H-35, N 337B
10/31/59	Virginia, Minnesota	Piper Cub, N 70811
10/31/59	Greenville, New York	Cessna 175, N 6504E
10/31/59	Idaho Falls, Idaho	Cessna 150, N 5629E
11/1/59	Nr. Cypress, Texas	Cessna 170, N 9247A
11/2/59	Lancaster, California	Stinson V-77B, N 70056
11/4/59	Crab Mountain, Tennessee	Cessna 175, N 6644E
11/6/59	Nr. Meadows, South Dakota	Piper Super Cub, N 2492A
11/6/59	Colonais Canyon, New Mexico	Morrisey 2150, N 134PA
11/6/59	Nr. Dawson Creek, B. C., Canada	Cessna 175, N 7562M
11/6/59	Nr. Mansfield, Ohio	Piper PA-22, N 9609D and Republic F84F
11/10/59	Nr. Madill, Oklahoma	Beechcraft Bonanza J-35, N 7220B
11/12/59	Nr. Somerset, Pennsylvania	Piper PA-18, N 7151K
11/13/59	Nr. Clarksdale, Mississippi	Aeronca 7AC, N 84414
11/14/59	Nr. Chester, New Jersey	Piper PA-18, N 7575D
11/16/59	Fort Worth, Texas	Beech Bonanza D-35, N 2932B
11/16/59	New Orleans, Louisiana	Cessna 310, N 4862B
11/17/59	American Falls, Idaho	Piper PA-18, N 8167D
11/17/59	Nr. Covington, Virginia	Cessna 182, N 5025D
11/17/59	Nr. Okeechobee, Florida	Beech Bonanza BN-35, N 789B
11/20/59	Ozona, Texas	Piper PA-22, N 4854A
11/21/59	Nr. Circleville, Ohio	Aeronca Champion, N 4429E
11/23/59	Nr. Orlando, Florida	Cessna 172, N 7231T
11/25/59	Nr. Kiowa, Colorado	Piper PA-24, N 5852P
11/25/59	Nr. River Falls, Wisconsin	Ercoupe 415C, N 87219
11/26/59	Nr. Bethlehem-Easton, Pennsylvania	Beechcraft Bonanza 35, N 3924N
11/27/59	Compton, California	Tri-Champion 7-FC, N 9055B
11/28/59	Nr. Kalama, Washington	Piper PA-23, N 4097P
11/29/59	Nr. Bowling Green, Kentucky	Piper PA-23, N 4179B
11/29/59	Nr. Kelso, California	Beech Bonanza 35, N 3979N

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DATE	LOCATION	AIRCRAFT
12/1/59	Red Bluff, California	Beechcraft AT-11, N 6962C
12/2/59	Coldwater, Mississippi	Cessna 172, N 7162A
12/3/59	Nr. Pompey's Pillar, Montana	Piper PA-22, N 8834D
12/5/59	Nr. Parsons, Tennessee	Ryan Navion, N 7710B
12/5/59	Nr. Palm Springs, California	Beech Travelair, N 9701R and Beech Bonanza, N 9202R
12/6/59	Nr. Washington, New Hampshire	Piper PA-23, N 4207P
12/7/59	Nr. Almyra, Arkansas	Navy N3N, N 44764
12/9/59	Nr. Benson, Arizona	Cessna 180, N 6530A
12/9/59	Palos Verdes, California	Beechcraft Bonanza 35, N 3739N
12/10/59	Nr. Willow, Alaska	Piper Super Cruiser, N 2334M
12/11/59	Elmira, New York	Beechcraft Bonanza G35, N 4470D
12/12/59	Nr. Roswell, New Mexico	Aeronca 7BCN, N 83296
12/12/59	Nr. Covington, Indiana	Cessna 182, N 6402A
12/14/59	Weaverville, California	Piper Tri-pacer, N 8832D
12/15/59	Nr. Cheyenne, Wyoming	Beechcraft Bonanza 35, N 1839D
12/16/59	Mackay, Idaho	Ercoupe 415C, N 2625H
12/18/59	Dover-Foxcroft, Maine	Cessna 182, N 2472G
12/20/59	Holly Pond, Alabama	Champion 7FC, N 9852B
12/20/59	Nr. Gorman, California	Cessna 182, N 21226
12/21/59	Girard, Illinois	Cessna 175, N 9489B
12/24/59	Fort Worth, Texas	Cessna 195, N 1050D
12/24/59	Lowell, Michigan	Bellanca 14-13-3, N 1313L
12/24/59	Simmsport, Louisiana	Piper PA-18, N 42435
12/25/59	Nr. Adamsville, Alabama	Cessna 172, N 4268F
12/27/59	Choudrant, Louisiana	Beechcraft 35, N 1222F
12/28/59	Morris, Illinois	Ercoupe 415C, N 2226H
	Nr. Beaumont, California	Cessna C-182, N 3877D

Civil Aeronautics Board
December 31, 1959

GENERAL AVIATION NON-FATAL ACCIDENTS - ROTORCRAFT
CALENDAR YEAR 1959

DATE	LOCATION	AIRCRAFT
1/6/59	Clearwater, Florida	Bell 47J, N 5192B
1/20/59	Santa Barbara, California	Bell 47G-2, N 5162B
1/26/59	Nr. Shreveport, Louisiana	Bell 47G, N 6327D
1/30/59	Lexington, Virginia	Bell 47G-2, N 2485B
2/9/59	West Broad Pass, Alaska	Bell 47G-2, N 6719D
3/2/59	New Guinea	Sikorsky S-58, N 886
3/6/59	Nr. Satsop, Washington	Bell 47G, N 957B
3/9/59	Netherlands, New Guinea	Bell Helicopter, N 4929V
3/11/59	Los Angeles, California	Bell 47G, N 35B
4/11/59	Detroit, Michigan	Bell 47J, N 2875B
4/13/59	Las Vegas, Nevada	Hughes 269A, N 79P
4/18/59	Dartmouth, Massachusetts	Hiller UH12B, N 5303V
4/20/59	Nr. Lafayette, Louisiana	Bell 47G, N 935B
4/26/59	Anchorage, Alaska	Bell 47G-2, N 6717D
4/28/59	Rayson, Arizona	Bell 47J, N 5150
5/4/59	Shortcut Saddle, California	Bell 47G-2, N 2870B
5/5/59	Grand Isle, Louisiana	Bell 47G, N 977B
5/14/59	Chicago, Illinois	Bell 47G-2, N 6744D
5/14/59	Haines Junction, Canada, Yukon Territory	Hiller, N 5308V
5/23/59	Port Moller, Alaska	Alouette II, N 516
6/2/59	Katalla, Alaska	Bell 47G-2, N 7891B
6/3/59	Eagle, Alaska	Bell 47G-2, N 6705D
6/5/59	Boerne, Texas	Bell 47G, N 2812B
6/10/59	Nr. Center Hall, Pennsylvania	Bell 47BD-1, N 5
6/12/59	Ponca City, Oklahoma	Bell 47B, N 116B
6/12/59	Galena, Illinois	Bell 47H-1, N 2827B
6/15/59	Nr. Hoboken, New Jersey	Bell G2, N 67B
6/19/59	Little Rock, Arkansas	Bell H-13, N 904H
6/20/59	Hartford, Connecticut	Benson Gyrocopter, N 9420H
6/21/59	Stockton, California	Bell 47G, N 970B
6/22/59	Clarksburg, West Virginia	Bell 47D, N 207B
6/24/59	Fresno, California	Bell 47D-1, N 138B
6/28/59	Nr. Stuttgart, Arkansas	Bell D-1, N 4226A
6/29/59	Nr. Jean, Nevada	Bell 47G, N 992B
6/30/59	Mammoth Lakes, California	Hiller UH-12E, N 5323V
6/30/59	Nr. Richfield, Utah	Bell 47G-2, N 5186B
7/4/59	Clovis, California	Hiller UH-12, N 8130
7/8/59	White Sulphur Springs, W. Va.	Bell 47G-2, N 5194B
7/9/59	Windsor, Connecticut	Hiller 12-A, N 8109N
7/11/59	Yakataga, Alaska	Sikorsky S-55, N 747N
7/13/59	Nr. Leesville, Louisiana	Bell 47G, N 973B
7/14/59	Chaleo, California	Bell 47G-2B, N 942B
7/19/59	Stuttgart, Arkansas	Bell 47D-1, N 6339D
7/22/59	Annette Island, Alaska	Hiller 12-B, N 5311V

GENERAL AVIATION NON-FATAL ACCIDENTS - ROTORCRAFT
CALENDAR YEAR 1959 - Continued

DATE	LOCATION	AIRCRAFT
7/25/59	Delhi, Iowa	Bell G-3, N 6730D
8/7/59	Quincy, California	Bell 47G-2, N 7893B
8/10/59	Wisconsin Dells, Wisconsin	Bell 47G-2, N 2828B
8/14/59	Kernville, California	Hiller 12E, N 5337V
8/16/59	Plymouth, Pennsylvania	Bell Helicopter, N 966
8/18/59	Garrison, Iowa	Benson Gyrocopter, N 94Y
8/22/59	Miami Beach, Florida	Bell 47B, N 2821B
8/27/59	Lake Wales, Florida	Hughes 269A, N 79P
8/31/59	Ely, Nevada	Hiller 12E, N 5341V
9/4/59	Hagerstown, Maryland	Umbaugh 18, N 43U
9/5/59	St. Louis, Missouri	Bell 47G-2, N 6740
9/7/59	Lansing, Illinois	Roloff Gyro-Plane, N 59Y
9/10/59	Chitina, Alaska	Bell 47G-2, N 941B
9/11/59	Mouth of Nation River on Yukon River, Alaska	Bell 47G-2, N 6757D
9/20/59	Osceola, Wisconsin	Benson Gyrocopter, N 4969E
9/21/59	Tuxedni Bay, Alaska	Bell 47G-2, N 46R
9/25/59	Timmins, Ontario, Canada	Bell 47J, N 2982B
10/3/59	Nr. Beaver, Oklahoma	Bell 47G-2, N 953
10/7/59	Nr. Karluk, Alaska	Bell 47D-1, N 117B
10/13/59	Kingman, Arizona	Bell 47J, N 5150B
10/16/59	Hanford, California	Bell 47, N 138B
10/22/59	Nr. Erie, Pennsylvania	Sikorsky S-58, N 422B
10/22/59	Hartford, Connecticut	Bell 47J, N 2893
10/30/59	Grayland, Washington	Bell 47G-2, N 2887B
11/17/59	Nr. Loudon, Tennessee	Bell 47G, N 3116G
11/18/59	Frederick, Oklahoma	Brantley B-2, N 6795D
11/23/59	Stratford, Connecticut	Sikorsky S62, N 882 Experimental
12/1/59	Grand Isle, Louisiana	Sikorsky S-55, N 745A
12/15/59	Los Angeles, California	Hiller VH12B, N 3112G
12/16/59	Rockford, Illinois	Benson Gyrocopter
12/28/59	Chicago, Illinois	Bell 47H-1, N 2818B

Civil Aeronautics Board
December 29, 1959

GENERAL AVIATION FATAL ACCIDENTS -- ROTORCRAFT
CALENDAR YEAR 1959

DATE	LOCATION	AIRCRAFT
1/13/59	Santa Rosa, New Mexico	Bell 47J, N 6718D
1/24/59	Shoshoni, Wyoming	Benson Gyrocopter
2/27/59	Conowingo, Maryland	Bell 47J Ranger, N 5156B
5/18/59	Sylhet, East Pakistan	Bell 47D-1, N 101B
7/12/59	Osage Beach, Missouri	Bell 47G, N 953B
7/25/59	Becharof Lake, Alaska	Bell Helicopter, N 6741B
7/26/59	Juneau, Alaska	Bell 47G-2, N 6775D
8/11/59	Colton Point, Maryland	Bell 47D-1, N 3918A
8/18/59	Clearfield, Utah	Hiller 12E, N 5341V
8/19/59	Austin, Texas	Brantley B2, N 6792D
9/24/59	Lovington, Virginia	Bell 47G-2, N 516B
11/30/59	Leesville, Louisiana	Republic Alouette II, N 519

Civil Aeronautics Board
December 29, 1959

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ACCIDENTS IN GENERAL AVIATION OPERATIONS

(Calendar Year 1938 - 1959)

Calendar Year	Accidents		Fatalities
	Total	Fatal	
1938	1,861	176	274
1939	2,222	203	315
1940	3,471	232	359
1941	4,252	217	312
1942	3,324	143	220
1943	3,971	167	257
1944	3,343	169	257
1945	4,652	322	508
1946	7,618	690	1,009
1947	9,253	882	1,352
1948	7,850	850	1,384
1949	5,459	562	896
1950	4,505	499	871
1951	3,824	441	750
1952	3,657	401	691
1953	3,232	387	635
1954	3,381	393	684
1955	3,343	384	619
1956	3,474	356	669
1957	4,200	436	800
1958	4,584	384	717
*1959	4,800	432	778

*Estimated.

December 30, 1959

ACCIDENT RATES IN GENERAL AVIATION FLYING

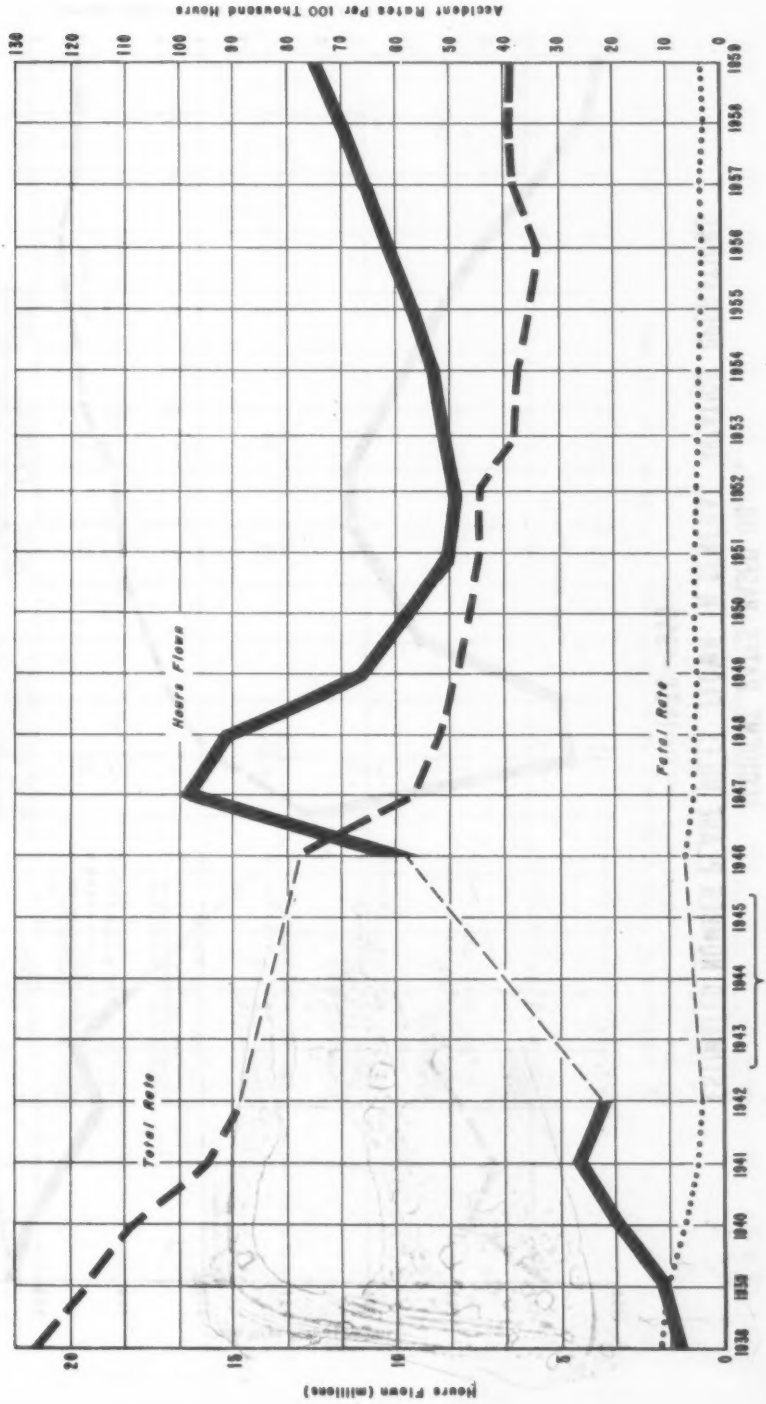
(Calendar Year 1938 - 1959)

Calendar Year	Hours Flown (000)	Estimated Plane-Miles Flown (000)	Accident Rates Per 100,000 Hours		Accident Rates Per Million Plane-Miles	
			Total	Fatal	Total	Fatal
1938.....	1,478	129,359	125.7	11.8	14.4	1.4
1939.....	1,922	177,868	117.0	10.7	12.5	1.1
1940.....	3,200	264,000	108.5	7.3	13.1	0.9
1941.....	4,460	346,303	94.5	4.8	12.3	0.6
1942.....	3,786	293,593	87.5	3.8	11.3	0.5
1943.....	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1944.....	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1945.....	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1946.....	9,788	874,740	77.7	7.0	6.7	0.8
1947.....	16,334	1,502,420	56.7	5.4	6.2	0.6
1948.....	15,130	1,469,540	52.0	5.6	5.3	0.6
1949.....	11,031	1,128,992	49.6	5.1	4.8	0.5
1950.....	9,650	1,061,500	46.4	5.2	4.2	0.5
1951.....	8,451	975,480	45.0	5.2	4.0	0.5
1952.....	8,186	972,055	44.6	5.0	3.8	0.4
1953.....	8,527	1,045,346	38.0	4.6	3.1	0.4
1954.....	8,963	1,119,295	37.6	4.4	3.0	0.4
1955.....	9,500	1,216,000	35.2	4.0	2.7	0.3
1956.....	10,200	1,315,000	34.0	3.5	2.6	0.3
1957.....	10,938	1,426,285	38.5	4.0	2.9	0.3
1958.....	11,700	1,544,000	39.1	3.3	3.0	0.3
*1959.....	12,400	1,575,000	38.7	3.5	3.0	0.3

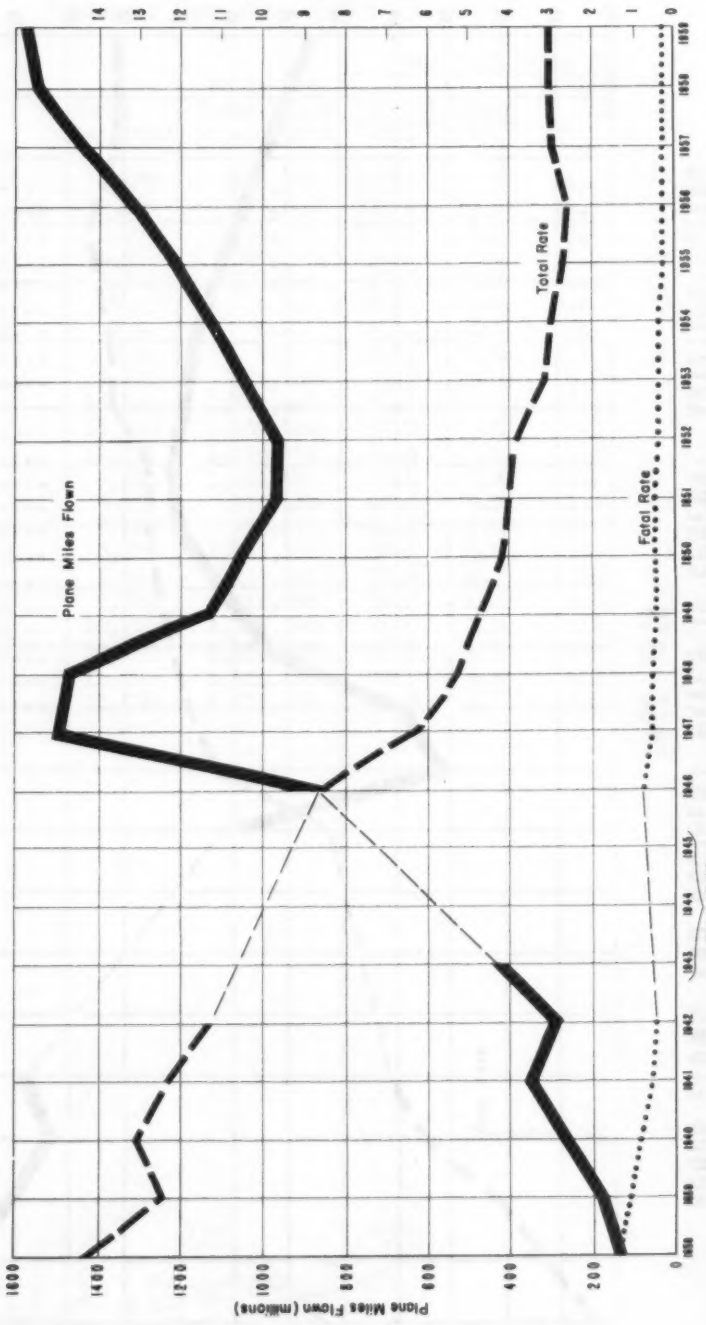
*Estimated.

December 30, 1959

HOURS FLOWN AND ACCIDENT RATES IN GENERAL AVIATION FLYING, 1938-1959



ACCIDENT RATES BASED ON
ESTIMATED NUMBER PLANE MILES FLOWN IN GENERAL AVIATION OPERATIONS
1938–1959



Not Available

PRELIMINARY STATISTICS OF FATAL
GENERAL AVIATION ACCIDENTS ANALYZED TO DATE
(DECEMBER 31, 1958 - DECEMBER 31, 1959)

Kind of Flying	Number of Fatal Accidents	Number of Fatalities			Total Fatalities
		Crew	Passenger	Other	
Business (Personnel)					
Under 12,500.....	32	32	28	-	60
12,500 and Above.....	-	-	-	-	-
Corporate (Executive)					
Under 12,500.....	-	-	-	-	0
12,500 and Above.....	-	-	-	-	
Commercial					
Under 12,500.....	43[a]	41	14	2	57
12,500 and Above.....	2[b]	2	3	-	5
Instructional					
Under 12,500.....	30	35	9	-	44
12,500 and Above.....	-	-	-	-	-
Pleasure					
Under 12,500.....	100	90	114	1	205
12,500 and Above.....	-	-		-	-
Other					
Under 12,500.....	20[c]	20	15	-	35
12,500 and Above.....	-	-	-	-	-
Subtotal.....	227	220	183	3	406

a/ includes 32 fatal crop control accidents and 34 related fatalities.
b/ one ferry accident and one charter accident.
c/ includes one x-c Glider - qualification flight.

NOTE: "Under and Above" - denote takeoff weight of aircraft.

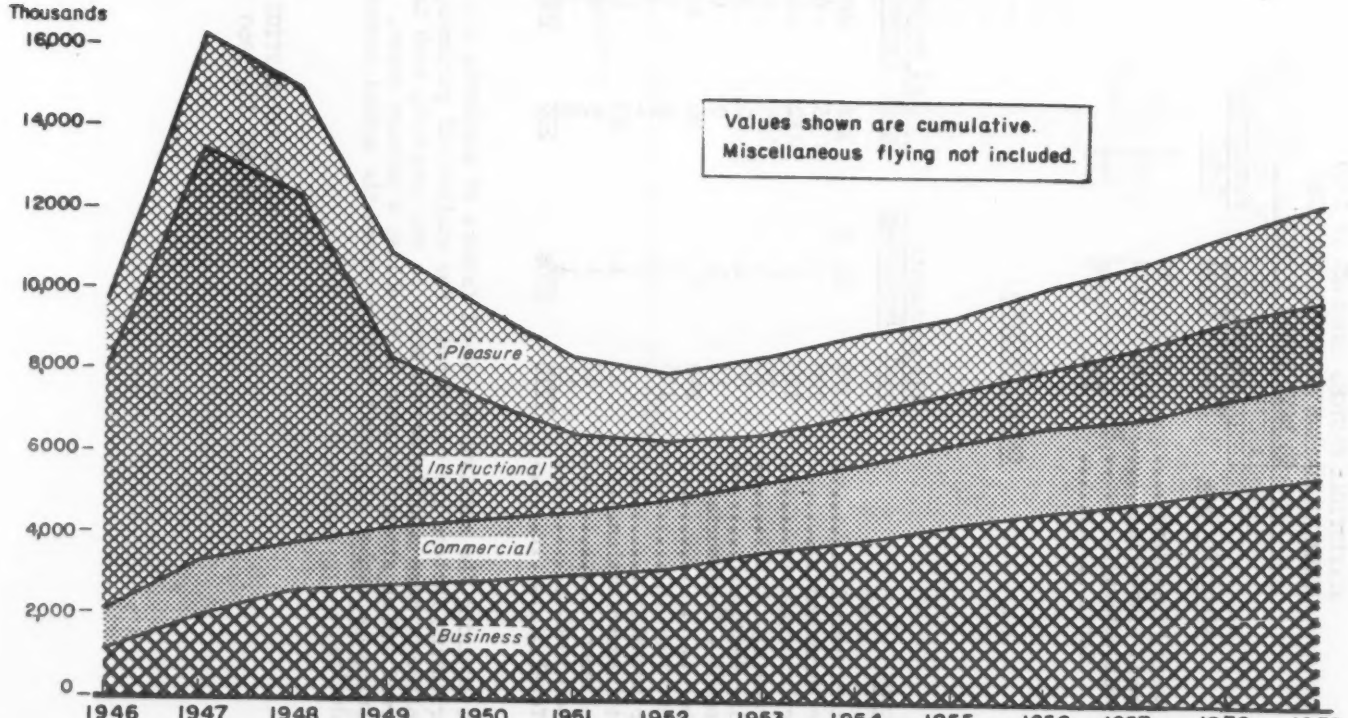
CONTINUED

HELICOPTERS

Kind of Flying	Number of Fatal Accidents	Number of Fatalities			Total Fatalities
		Crew	Passenger	Other	
Contract-Charter.....					
Passenger.....	2	1	-	1	2
Exhibition - Demonstration	2	2	3	-	5
Subtotal.....	4	3	3	1	7
Total.....	231	223	186	4	413

CIVIL AERONAUTICS BOARD
BUREAU OF SAFETY
DECEMBER 31, 1959

HOURS FLOWN BY TYPES OF FLYING
GENERAL AVIATION



SOURCE: Federal Aviation Agency.

STATISTICAL FACTORS INVOLVED IN 1729
GENERAL AVIATION ACCIDENTS ANALYZED
TO DATE 1959

Aircraft Type	Accidents		Fatalities
	Fatal	Total	Total
Large Fixed-Wing.....	2	15	5
Small Fixed-Wing.....	225	1671	401
Helicopters.....	4	43	7
Total.....	231	1729	413

CAUSAL FACTORS

Category	All Accidents		Fatal Accidents	
	Total	Percentage	Total	Percentage
Pilot Personnel.....	1376	62 %	182	67 %
Other Personnel.....	120	5	16	6
Powerplant.....	123	5	12	4
Airframe.....	15	1	5	2
Landing Gear.....	80	4	0	0
Equipment & Accessories..	16	1	0	0
Weather.....	250	11	26	10
Airport Terrain.....	186	8	1	1
Rotor Assembly.....	3	0	1	1
Pilot Incapacitation.....	13	1	13	4
Miscellaneous.....	17	1	5	2
Undetermined.....	11	1	8	3
Total.....	2210	100%	269	100%

In determining the statistical causal factors of accidents all contributing factors are considered. For statistical purposes, where two or more causal factors exist in one accident, each is recorded and no attempt is made to establish a primary cause. As a result, the number of causal factors exceed the actual number of accidents.

CIVIL AERONAUTICS BOARD
JANUARY 11, 1960

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RELATIVE FREQUENCY OF MIDAIR COLLISIONS
AND TOTAL ACCIDENTS - CIVIL AIRCRAFT
(1947 - 1958)

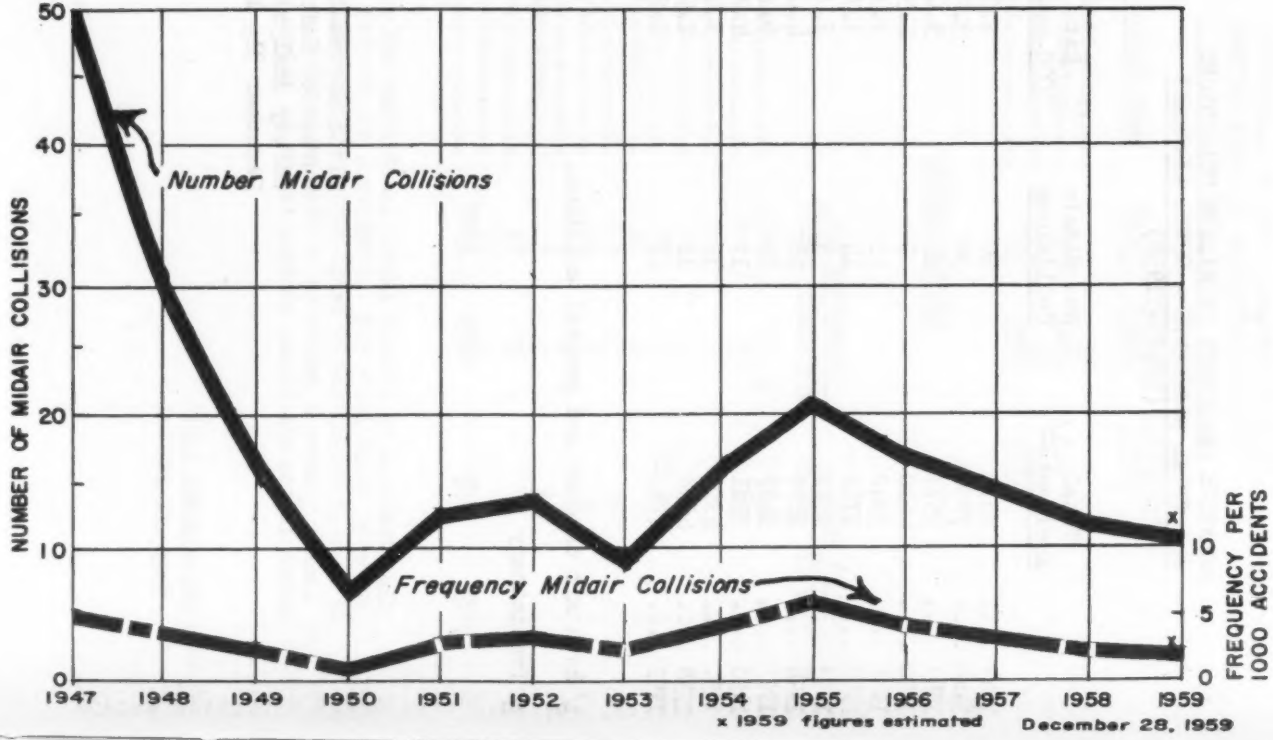
	Total Accidents[1/]	No. Midair Collisions	Rate Per 1000 Accidents
1947	9372	50	5.33
1948	7980	30	3.75
1949	5571	17	3.05
1950	4610	7	1.51
1951	3942	13	3.3
1952	3763	14	3.72
1953	3329	9	2.7
1954	3477	16	4.61
1955	3439	21	6.12
1956	3581	17	4.74
1957	4302	15	3.48
1958	4648	12	2.58
1959	4912[a/]	11	2.23

1/ Both air carrier and general aviation.

a/ Preliminary

Civil Aeronautics Board
Bureau of Safety
Safety Analysis Division
December 31, 1959

NUMBER OF MIDAIR COLLISIONS INVOLVING CIVIL AIRCRAFT
and
FREQUENCY RELATIVE TO TOTAL NUMBER OF ACCIDENTS-CIVIL FLYING
1947–1959



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[Reprinted from FEDERAL REGISTER of February 28, 1959]

CIVIL AERONAUTICS BOARD, SAFETY INVESTIGATION REGULATIONS, EFFECTIVE FEBRUARY 28, 1959

Title 14—CIVIL AVIATION

Chapter I—Civil Aeronautics Board

SUBCHAPTER D—SAFETY INVESTIGATION REGULATIONS

[Reg. No. SIR-1]

PART 320—NOTIFICATION AND REPORTING OF AIRCRAFT ACCIDENTS AND OVERDUE AIRCRAFT

Adopted by the Civil Aeronautics Board at its office in Washington, D.C., on the 24th day of February 1959.

Under the Civil Aeronautics Act the Board could permit the Administrator, by delegation of authority, to investigate accidents and determine the probable cause thereof. Such a delegation was in fact made by the Board with respect to accidents of fixed-wing aircraft having a maximum take-off weight of 12,500 pounds, 18 F.R. 7499. Subpart A of Part 62 of the Civil Air Regulations reflected this delegation to the Administrator of Civil Aeronautics.

The Federal Aviation Act of 1958 repealed the Board's authority to delegate its accident investigation function to the Administrator, thereby rendering the outstanding delegation void. The new Act contemplates that the accident investigation function is to be performed by the Board itself. Therefore, in lieu of a power of delegation of the function, the new Act merely permits the Board to request the Administrator of the Federal Aviation Agency to investigate the facts and circumstances surrounding aircraft accidents and to report them to the Board, the function of determining probable cause being reserved to the Board in all cases.

The Board recently issued Public Notice PN 13, effective December 31, 1958, requesting the Administrator of the Federal Aviation Agency to investigate all civil aircraft accidents involving fixed-wing aircraft which have a maximum gross take-off weight of 12,500 pounds or less, except accidents involving aircraft operated by certificated Alaskan air carriers and accidents involving fatal injuries to any occupant of the aircraft, 23 F.R. 10492. This request to the Administrator is necessary because sufficient funds have not been made available to the Board to provide adequate facilities and personnel to handle the additional workload prescribed by the Act. Therefore, the request is temporary and may be rescinded by the Board through written notice to the Administrator.

This change in the law and arrangements necessitates changes in the existing reporting regulation which are not of a substantive nature. The substance of the regulation is being transferred to Subchapter D–Safety Investigation Regulations as new Part 320. Subpart A now contains the notifying and reporting requirements applicable to accidents investigated by the Board itself, while Subpart B contains those applicable to the accidents investigated by the Administrator pursuant to PN 13. Subpart B reflects the fact that under the present request of the Board as set forth in PN 13, accidents involving fatalities on board aircraft are excluded, as well as the fact that Subpart B is applicable only as long as the request remains outstanding in its present form.

As before, violations of either subpart of Part 320 will constitute violations of Board regulations which will be prosecuted by the Board's Office of Compliance under the provisions of the Act applicable to violations of Title VII and rules made thereunder.

Since there are no substantive changes made in this regulation and it does not impose any additional burdens on any person, public notice and proceedings hereon are not required and not in the public interest, and the new regulation may be made effective before the expiration of 30 days from the time of its publication.

Accordingly, the Board, effective upon publication in the FEDERAL REGISTER, i.e., February 28, 1959:

(1) Repeals Part 62 of the Civil Air Regulations (14 CFR, Chapter I, Subchapter A, Part 62);

(2) Changes the designation of Subchapters D and E of its regulations (14 CFR, Chapter I) to Subchapters E and F, respectively; and

(3) Promulgates a new subchapter of its regulations to read as follows:

APPLICABILITY AND DEFINITIONS

Sec.
320.1 Applicability of this part.
320.2 Definitions.

Subpart A—Notification and reporting to the Civil Aeronautics Board

320.4 Applicability of Subpart A of this part.

NOTIFICATION REQUIREMENTS

320.5 When notification is to be given.
320.6 Responsibility for giving notification.
320.7 To whom notification is directed.
320.8 Information to be given in notification.

REPORTING REQUIREMENTS

320.10 When a report is made.
320.11 Responsibility for making report.
320.12 Form of report and contents.
320.13 To whom the report is directed.

PRESERVATION OF AIRCRAFT WRECKAGE AND RECORDS

320.15 Preservation of wreckage and records.
320.16 Prohibition against removing or disturbing wreckage and records.
320.17 Recording of original position and condition of wreckage.
320.18 Release of wreckage.

NOTIFICATION OF OVERDUE AIRCRAFT

320.20 When notification is to be given.

Subpart B—Notification and reporting to the Administrator of the Federal Aviation Agency

Sec.
320.30 Applicability of Subpart B of this part.

NOTIFICATION REQUIREMENTS

320.31 When notification is to be given.
320.32 Responsibility for giving notification.
320.33 To whom notification is directed.
320.34 Information to be given in notification.

REPORTING REQUIREMENTS

320.38 When a report is made.
320.39 Responsibility for making report.
320.40 Form of report and contents.
320.41 To whom the report is directed.

PRESERVATION OF AIRCRAFT WRECKAGE AND RECORDS

320.45 Preservation of aircraft wreckage and records.
320.46 Prohibition against removing or disturbing aircraft wreckage and records.
320.47 Recording of original position and condition of wreckage.
320.48 Release of wreckage.

NOTIFICATION OF OVERDUE AIRCRAFT

320.50 When notification is to be given.

AUTHORITY: §§ 320.1 to 320.50 issued under sec. 204(a), 72 Stat. 743, 49 U.S.C. 1324. Interpret or apply sec. 701(a)(d)(f), 72 Stat. 781, 49 U.S.C. 1441.

APPLICABILITY AND DEFINITIONS

§ 320.1 Applicability of this part.

This part establishes requirements for the notification and reporting of accidents involving civil aircraft in the United States, its Territories and Possessions, and aircraft of United States registry wherever they occur. It further establishes requirements for the notification of overdue aircraft. Subpart A of this part covers the notification and reporting to be made to the Civil Aeronautics Board, while Subpart B covers the notification and reporting to be made to the Administrator of the Federal Aviation Agency concerning those aircraft the accidents of which are investigated by the Administrator pursuant to request by the Board under section 701(f) of the Federal Aviation Act of 1958.

§ 320.2 Definitions.

As used in this part the words listed below shall be defined as follows:

(a) *Act.* "Act" means the Federal Aviation Act of 1958, 72 Stat. 731, 49 U.S.C. 1301 et seq.

(b) *Administrator.* "Administrator" means the Administrator of the Federal Aviation Agency.

(c) *Board.* "Board" means the Civil Aeronautics Board.

(d) *Aircraft accident.* An aircraft accident is an accident which occurs during the starting or warming up of an engine or engines, or operation of an aircraft, which results in serious or fatal

injury to one or more persons or in substantial damage to any aircraft, or which involves a collision of two or more aircraft. Whenever serious or fatal injury results from contact with a rotating propeller which is installed on an aircraft, it shall be considered an aircraft accident.

(e) *Aircraft accident incident to flight.* An aircraft accident incident to flight is an aircraft accident which occurs between the time an engine or engines are started for the purpose of commencing flight until the aircraft comes to rest with all engines stopped for complete or partial deplaning or unloading. It excludes death or injuries to persons on board which result from illness, altercations, and other incidents not directly attributable to flight operation.

(f) *Aircraft accident not incident to flight.* An aircraft accident not incident to flight is an aircraft accident other than one defined in paragraph (e) of this section as incident to flight.

(g) *Operator.* An operator of aircraft is the person who causes or authorizes the operation of the aircraft, such as the owner or lessee of an aircraft.

(h) *Fatal injury.* A fatal injury is an injury which results in death within 30 days.

(i) *Serious injury.* A serious injury is an injury which requires hospitalization and medical treatment for a period of five or more days, or results in a fracture of any bone (except simple fractures of fingers, toes, or nose), lacerations which cause severe hemorrhages, or involve muscles, injury to any internal organ, or second or third degree burns or any burns involving more than five percent of the body surface: *Provided*, That the injury does not result in death within 30 days.

(j) *Substantial damage.* Substantial damage is damage which necessitates major overhaul of the aircraft or the replacement of or extensive repairs to any major component or combination of components of the aircraft. It does not include damage such as scraped wing tips, bent fairing or cowling, small punctured holes in the skin or fabric, dented skin or trailing edge, repairable damage to propeller blades, or damage to tires, engine accessories, or brakes.

(k) *Small fixed-wing aircraft.* Fixed-wing aircraft having a maximum certificated take-off weight of 12,500 pounds or less.

Subpart A—Notification and Reporting to the Civil Aeronautics Board

§ 320.4 Applicability of Subpart A of this part.

The provisions of this subpart apply to all aircraft except those investigated by the Administrator pursuant to an outstanding request by the Board under section 701(f) of the Act.

NOTE: By Public Notice PN 13, 23 F.R. 10492, effective December 31, 1958, the Board requested the Administrator to investigate all civil aircraft accidents involving fixed-wing aircraft which have a certificated maximum gross take-off weight of 12,500 pounds or less, except accidents involving aircraft operated by air carriers authorized by certificate of public convenience and necessity to engage in air transportation in the State of Alaska, and accidents in which fatal injuries have occurred to any occupants of such aircraft. Amendments to, or rescission of, this public Notice will be published in the FEDERAL REGISTER.

NOTIFICATION REQUIREMENTS

§ 320.5 When notification is to be given.

Immediate notification shall[1] be given of any aircraft accident involving aircraft within the applicability of this subpart. Immediate notification also shall be given of any occurrence of fire involving any of the components or systems aboard the aircraft when incident to flight, regardless of the extent of injury to occupants or damage to the aircraft.

§ 320.6 Responsibility for giving notification.

The operator of the aircraft shall be responsible for giving notification as provided in § 320.5.

§ 320.7 To whom notification is directed.

The notification shall be directed to the Civil Aeronautics Board direct or through its nearest office. The notification shall be sent by the most expeditious means of communication available.

§ 320.8 Information to be given in notification.

The notification shall include the following information concerning the accident, if available: Location, date, time of day, number of persons involved, injuries to each, aircraft identification including registration number, aircraft make and model, names of crew members, operator, and briefly the nature of circumstances surrounding the accident.

REPORTING REQUIREMENTS

§ 320.10 When a report is made.

A written report shall be made of every aircraft accident incident to flight involving aircraft of United States registry wherever it may occur.[1] A written report will not be required on any aircraft accident not incident to flight, unless the operator has been requested to make such a report by an authorized representative of the Civil Aeronautics Board.

§ 320.11 Responsibility for making report.

The operator of the aircraft involved in the accident shall be responsible for making the written report required by § 320.10. The report shall be made as soon as practicable and good cause shown in writing for any delay over 10 days. Each member of the crew involved in the accident, if physically able at the time of the submission of the report, shall attach thereto a signed statement setting forth the facts, conditions, and circumstances pertinent to the accident. If incapacitated at the time of the submission of the report, each crew member shall submit a statement as soon as physically able.

§ 320.12 Form of report and contents.

The report shall be made in duplicate on an accident report form furnished by the Civil Aeronautics Board and shall contain all available information required therein.[2]

§ 320.13 To whom the report is directed.

The report shall be mailed or delivered to the office or representative of the Civil Aeronautics Board nearest the residence of the operator involved, or as otherwise directed by an authorized representative of the Civil Aeronautics Board.[3]

PRESERVATION OF AIRCRAFT WRECKAGE AND RECORDS

§ 320.15 Preservation of wreckage and records.

Aircraft wreckage and records thereof involved in or pertaining to an aircraft accident shall be preserved for the Board by the operator.[4]

§ 320.16 Prohibition against removing or disturbing wreckage and records.

Aircraft wreckage or records thereof involved in or pertaining to an aircraft accident shall not be disturbed or removed, unless specific permission is granted by an authorized representative of the Civil Aeronautics Board, except where necessary (a) to give assistance to persons injured or trapped therein, (b)

[1] Refer to definitions contained in paragraphs (d), (e), and (f) of § 320.2.

[2] Report Forms CAB 454 and, for small fixed-wing aircraft accidents, ACA 2400, are available from the Washington offices of the Civil Aeronautics Board, Universal Building, Washington 25, D.C., and from all field offices of the Board.

[3] The locations of the field offices of the Board are as follows:

New York Office: Room 101, Federal Building, New York International Airport, Jamaica, N.Y.

Miami Office: P.O. Box 931, Miami International Airport Branch, Miami 48, Fla.

Chicago Office: 6127 West Cermak Road, Cicero, Ill.

Kansas City Office: 4825 Troost Avenue, Kansas City 10, Mo.

Fort Worth Office: P.O. Box 108, Fort Worth 1, Tex.

Los Angeles Office: Pacific Building, 1735 Centinella Avenue, Inglewood, Calif.

Oakland Office: P.O. Box 2386, Oakland Airport Station, Oakland 14, Calif.

Seattle Office: Room 202, Administration Building, King County Airport, Seattle 8, Wash.

Anchorage Office: P.O. Box 2219, Anchorage, Alaska.

[4] Where accidents occur outside of the United States, its Territories, or possessions, the operator shall only be responsible for taking such measures for preserving aircraft wreckage or records as may legally be taken in the place where the accident occurs.

to protect such wreckage from further serious damage, or (c) to protect the public from injury.

§ 320.17 Recording of original position and condition of wreckage.

Whenever wreckage is moved in accordance with the provisions of § 320.16, prior to the removal, sketches or photographs shall be made of the original position and condition of the wreckage and marks on the ground, and any pertinent data which cannot be effectively photographed shall be recorded, unless the resultant delay would endanger the lives of persons injured or trapped, or unless essential public interests can be protected only by immediate movement. In any event, movement of the wreckage shall be so accomplished as to entail the minimum possible disturbance thereof, and shall be preserved in accordance with the provisions of § 320.15.

§ 320.18 Release of wreckage.

Aircraft wreckage or records thereof involved in or pertaining to an aircraft accident shall not be released for repair, salvage, disposal, or any other purpose until permission is granted by an authorized representative of the Civil Aeronautics Board.

NOTIFICATION OF OVERDUE AIRCRAFT

§ 320.20 When notification is to be given.

When an aircraft is overdue and the operator believes that it has been involved in an accident, the operator shall immediately notify the Civil Aeronautics Board in accordance with the provisions of §§ 320.7 and 320.8. In addition, it shall be the responsibility of the operator to furnish such records pertinent to the flight as may be requested by the Civil Aeronautics Board.

NOTE: The reporting and record-keeping requirements contained herein have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

Subpart B—Notification and Reporting to the Administrator of the Federal Aviation Agency

§ 320.30 Applicability of Subpart B of this part.

The provisions of this subpart apply only to those aircraft which are investigated by the Administrator pursuant to an outstanding request by the Board under section 701(f) of the Act.

NOTE: See note under § 320.4.

NOTIFICATION REQUIREMENTS

§ 320.31 When notification is to be given.

In the case of aircraft within the applicability of this subpart, immediate notification shall be given when any aircraft accident incident to flight occurs which (a) is known or believed to have resulted from structural failure of an aircraft, aircraft engine, or propeller, (b) involves collision of two or more aircraft in the air, or (c) results in serious injury to any person, or fatal injury to any person not an occupant of the aircraft. Notification shall also be given of any occurrence of fire involving any of the components or systems on board the aircraft when incident to flight, regardless of the extent of injury to occupants or damage to the aircraft.

NOTE: Accidents involving fatal injury to occupants of the aircraft are investigated by the Board. See note under § 320.4.

§ 320.32 Responsibility for giving notification.

The pilot or pilots, or, if the pilots are incapacitated, the operator shall be responsible for giving such notification.

§ 320.33 To whom notification is directed.

The notification shall be directed to the nearest Federal Aviation Agency communications station, aviation safety district office, or aviation safety inspector.

§ 320.34 Information to be given in notification.

The notification shall include the following information concerning the accident, if available: Location, date, time of day, number of persons involved, injuries to each, aircraft identification including registration number, aircraft make and model, names of crew members, operator, and briefly the nature of circumstances surrounding the accident.

REPORTING REQUIREMENTS

§ 320.38 When a report is made.

A written report shall be made of every aircraft accident incident to flight involving aircraft of United States registry wherever it may occur, when there is serious injury or fatal injury to a nonoccupant of the aircraft, or where the reasonably estimated cost of repair is $100 or more. A written report may also be required for an aircraft accident not incident to flight, or for any accident involving minor injury or less than $100 estimated cost of repair if the pilot, owner, or operator is requested by an authorized representative of the Federal Aviation Agency to furnish it.

§ 320.39 Responsibility for making report.

The pilot or operator of the aircraft involved in the accident shall be responsible for making the written report required by § 320.38. The report shall be made as soon as possible and good cause shown in writing for any delay over seven days. If the operator is not the pilot, then each pilot involved in the accident, if physically able at the time of the submission of the report, shall sign the report or attach thereto a signed statement setting forth the facts, conditions, and circumstances pertinent to the accident. If incapacitated at the time of the submission of the report, each pilot shall submit such a statement as soon as he is physically able to do so.

§ 320.40 Form of report and contents.

The report shall be made in triplicate on an accident report form furnished by the Federal Aviation Agency and shall contain all available information required therein.

§ 320.41 To whom the report is directed.

The report shall be mailed or delivered to the nearest aviation safety district or regional office of the Federal Aviation Agency. However, where a State by agreement with the Agency actively participates in the investigation of non-aircarrier accidents and the accident occurred in that State, a State aviation official or investigator is authorized to receive such report and exhibits in behalf of the Agency.

NOTE: Where a State aviation authority receives such an accident report and exhibits or conducts the investigation in behalf of the Agency, distribution of the copies of the report shall be in accordance with the agreement with the Agency.

PRESERVATION OF AIRCRAFT WRECKAGE AND RECORDS

§ 320.45 Preservation of aircraft wreckage and records.

Aircraft wreckage and records thereof involved in or pertaining to an accident of which notification must be given under the provisions of § 320.31 shall be preserved for the Agency by the pilot, owner, or operator.[2] Wreckage of aircraft involved in accidents not requiring notification under § 320.31 need not be preserved, unless specifically ordered by an authorized representative of the Federal Aviation Agency.

§ 320.46 Prohibition against removing or disturbing aircraft wreckage and records.

Aircraft wreckage and records thereof involved in or pertaining to an accident of which notification must be given under the provisions of § 320.31 shall not be disturbed or removed, unless specific permission is granted by an authorized representative of the Federal Aviation Agency, except where necessary (a) to give assistance to persons injured or trapped therein, (b) to protect such wreckage from further serious damage, or (c) to protect the public from injury.

§ 320.47 Recording of original position and condition of wreckage.

Whenever wreckage is moved in accordance with the provisions of § 320.46, prior to the removal, sketches or photographs shall be made of the original position and condition of the wreckage and marks on the ground, and any pertinent data which cannot be effectively photographed shall be recorded, unless the resultant delay would endanger the lives of

[2] Where accidents occur outside of the United States, its Territories, or possessions, the operator shall only be responsible for taking such measures for preserving aircraft wreckage or records as may legally be taken in the place where the accident occurs.

persons injured or trapped, or unless essential public interests can be protected only by immediate movement. In any event, movement of the wreckage shall be so accomplished as to entail the minimum possible disturbance thereof, and shall be preserved in accordance with the provisions of § 320.45.

§ 320.48 Release of wreckage.

Aircraft wreckage or records thereof involved in or pertaining to an accident of which notification must be given under the provisions of § 320.31 shall not be released for repair, salvage, disposal, or any other purpose until permission is granted by an authorized representative of the Federal Aviation Agency.

NOTIFICATION OF OVERDUE AIRCRAFT

§ 320.50 When notification is to be given.

When an aircraft is overdue and the operator or owner believes that it has been involved in an accident, the operator or owner shall immediately notify the Federal Aviation Agency in accordance with the provisions of §§ 320.32 through 320.34. In addition, it shall be the responsibility of the owner or operator to furnish such records pertinent to flight as may be requested by the Federal Aviation Agency. If the aircraft is still missing upon the expiration of seven days, the reporting provisions of §§ 320.38 through 320.41 shall be complied with.

By the Civil Aeronautics Board.

[SEAL] MABEL MCCART,
Acting Secretary.

[F.R. Doc. 50-1793; Filed, Feb. 27, 1950; 8:51 a.m.]

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CIVIL AERONAUTICS BOARD

PUBLIC NOTICE PN 13

Effective December 31, 1958

The Federal Aviation Act of 1958, which becomes effective December 31, 1958, requires the rescission of Public Notice PN 7. In lieu thereof the following request is issued.

REQUEST TO THE ADMINISTRATOR OF THE FEDERAL AVIATION AGENCY TO INVESTIGATE CERTAIN AIRCRAFT ACCIDENTS FOR A TEMPORARY PERIOD

Acting pursuant to the authority vested in it by Title VII of the Federal Aviation Act of 1958 the Civil Aeronautics Board hereby requests the Administrator of the Federal Aviation Agency to exercise his authority, subject to the terms, conditions, and limitations of Title VII, and as set forth below, to investigate the facts, conditions, and circumstances surrounding certain fixed-wing aircraft accidents and to submit a report to the Board from which the Board may make a determination of the probable cause.

1. The authority which you are requested to exercise under Section 701 (f) of the Federal Aviation Act of 1958 shall include the investigation of all civil aircraft accidents involving fixed-wing aircraft which have a certificated maximum gross takeoff weight of 12,500 pounds, or less; Provided that, this authority shall not extend to any accident involving an aircraft operated by any air carrier authorized by certificate of public convenience and necessity to engage in air transportation in the State of Alaska; Provided further, that this authority shall not include the investigation of aircraft accidents in which fatal injuries have occurred to any occupants of such aircraft; Provided further, that this authority shall not be construed as authorization for the Administrator to hold public hearings or to make a determination of the probable cause of any accident; and Provided further, that the Administrator will report to the Board in a form acceptable to the Board, the facts, conditions, and circumstances surrounding each accident from which the Board may determine the probable cause.

2. If at any time the Board shall determine either upon request of the Administrator or upon its own initiative that the circumstances of a particular accident being investigated by the Administrator pursuant to this request are of sufficient public interest, the Board upon notification to the Administrator may terminate this authority and assume full responsibility for the conduct of this investigation for the particular accident in the same manner as an accident not covered by this request.

3. This request to the Administrator is necessary because sufficient funds have not been made available to the Board to

provide adequate facilities and personnel to handle the additional workload prescribed by the Act. Therefore, this request for the Administrator to exercise his authority as set out in Section 701 (r) of the Federal Aviation Act of 1958, is temporary to be effective December 31, 1958, and may be rescinded by the Board through written notice to the Administrator.

/s/
Mabel McCart
Acting Secretary

[P.N. 13 appeared in the Federal Register December 30, 1958]

REVIEW OF THE FEDERAL AVIATION ACT

(Air Safety)

TUESDAY, FEBRUARY 23, 1960

U.S. SENATE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The committee met, pursuant to notice, at 2:07 p.m., in room 5110, New Senate Office Building, Hon. A. S. Mike Monroney presiding.

Senator MONRONEY. The Subcommittee on Aviation is convened at special call, at the request of the Civil Aeronautics Board, pursuant to our agreement with them following their report on the accident involving the National Airlines DC–6B aircraft which occurred on January 6, 1960, near Wilmington, N.C. On the 14th of January, at the request of the Civil Aeronautics Board, the Aviation Subcommittee sat in public hearings and received evidence regarding the unusual nature of this accident. At that time it was agreed that if anything further were developed that had been reasonably checked out, that the Board would again appear before the committee to give the committee and public, in open session, the benefits of their investigation up to the present time.

It is our privilege today to hear Chairman Durfee, of the Civil Aeronautics Board, accompanied by several of his staff, regarding this additional report which we were advised today could be made as to such findings as their careful study and investigation of this matter have produced.

Mr. Chairman, we are glad to have you and your staff here. You may proceed in your own way.

STATEMENT OF HON. JAMES R. DURFEE, CHAIRMAN OF THE CIVIL AERONAUTICS BOARD; ACCOMPANIED BY JAMES JULIANA, EXECUTIVE DIRECTOR, CAB; LEON H. TANGUAY, ACTING DIRECTOR OF THE BUREAU OF SAFETY, CAB; MR. McWHORTER, HEARING AND REPORTS DIVISION, CAB; JOHN PAHL, CHIEF OF THE ENGINEERING DIVISION, CAB; AND EDWARD SLATTERY, INFORMATION OFFICER, BUREAU OF SAFETY, CAB

Mr. DURFEE. Mr. Chairman, I am accompanied here by appropriate members of the staff of the Bureau of Air Safety. Mr. James Juliana, the executive director of the Board, on my left; Mr. Tanguay, Acting Director of the Bureau of Safety, on my left; Mr. McWhorter, of the Hearing and Reports Division, at my right; and at the far right, John Pahl, Chief of the Engineering Division, Bureau of Safety; and Edward Slattery, information officer, Bureau of Safety.

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Since the 14th of January and the previous hearings to which you have already referred, Mr. Chairman, the Board's investigation has been continued very thoroughly and vigorously. We are here to report to you again today at your request on the accumulation of recent and additional and significant technical evidence.

I wish to emphasize, however, that the report which I am about to submit to you today is not an accident report as the Board regards an accident report. We would merely like to give you a synopsis of the facts as we have developed them. We are going to at this time go into any determination of the probable cause of this accident as the Board will develop this after a hearing. I believe we are prepared to state at this time that we anticipate that we will have a hearing on the 22d day of March at Wilmington, N.C., where the mockup of the airplane has been reassembled.

Senator MONRONEY. What date was that?

Mr. DURFEE. March 22, 10 a.m.

Mr. McWhorter will be the hearing officer in charge.

I wish to make it clear that the Board is not here today to attempt to perform its most important function, and that is a causal finding. We are not going to attempt that here today.

One of the initial features of this accident centered on the fact that although our investigators had located large fuselage skin fragments and some cabin interior of this airplane in the vicinity of Kure Beach, the main portion of the wreckage was found near the town of Bolivia, N.C., some 20 miles inland from the coastal area of Kure Beach.

With the trained investigators of the Board this was irrefutable evidence that the aircraft had begun to disintegrate in the air—and at this time—in the Kure Beach area from causes unknown. Three days after the accident occurred we located the body of a passenger near where the original fragments had been found in the coastal area on Kure Beach. The location was on the west bank of the Cape Fear River. It was obvious that the fragments of the aircraft and the body of the passenger had left the airplane some 20 miles, and several minutes, before the main structure of the aircraft hit the ground.

The passenger, whose name was Julian Andrew Frank, had sustained injuries of an unusual nature not compatible with injuries normally connected with aircraft accidents. I believe Mr. Bakke went into detail about this on the 14th of January.

Foreign objects were found deeply imbedded in Mr. Frank's body. Mr. Frank carried accident and life insurance policies, I believe it was reported the last time, in the amount of $875,000, but according to information we presently have, it is in excess of $1 million—all of which were obtained during the previous year.

These initial facts, while not conclusive of themselves, nevertheless provided clues to our investigators which led them to an accumulation of evidence developed by utilizing all modern methods of medical and aeronautical investigative techniques.

In the meantime our investigators had determined there was a need to reconstruct the fuselage of this aircraft as completely as possible. They began the collection of every piece of wreckage, most of which was photographed prior to being moved from its original position on

the ground. Board investigators constructed a mockup in an empty hangar at the Wilmington Airport using a wooden frame covered with chicken wire conforming to the measurements of the DC–6B fuselage. Each piece was wired into position on this frame in what would have been its original position on the aircraft structure. The completed mockup disclosed no evidence to our investigators of structural failure arising from design, construction, or performance of the aircraft. Similarly, a teardown of the engines by our investigators disclosed no malfunction that could have caused the accident, and at the same time it was determined that there had been no in-flight propeller failure.

Simultaneously with these initial findings, our investigators were concentrating on obtaining all types of samples from the aircraft for microscopic and technical inspection in laboratories. At the same time numerous tissue samples obtained during autopsy from the body of Julian Frank were transmitted at the request of the Board for clinical examination to the Armed Forces Institute of Pathology in Washington, D.C.; medical examiner's office in New York City; and to the Federal Bureau of Investigation laboratory in Washington.

Without going into specific details, Mr. Chairman, the result of these laboratory examinations revealed numerous foreign objects imbedded in the tissue of Julian Frank's body, consisting of such items as small pieces of steel wire, cloth fibers, and black deposits which were later determined to be manganese dioxide, a substance found in dry-cell batteries. From the analysis of aircraft parts it was determined that manganese dioxide was also present in several places within the cabin of the aircraft. Furthermore, X-ray examination disclosed a number of objects foreign to the aircraft deeply imbedded in the carpeting and other sections of the aircraft.

With all of this evidence before us—and again I emphasize it is not my intention to go into any great detail at this time—it was apparent to our investigators that the catastrophic failure of the outer shell of the DC–6B occurred in the vicinity forward of the front spar on the right side of the aircraft and that progressive disintegration occurred subsequently.

You can tell the aircraft crashed 20 miles inland. The rupture of the right forward cabin wall in the vicinity of seats 6 and 7 coincided with portions of the fuselage skin found at Kure Beach, and also correspond to the area of the cabin in which Mr. Frank was believed to have been located.

We have a chart here which can best demonstrate the particular area of the aircraft we are talking about where the original structure failure occurred on the coastal area at Kure Beach.

Senator MONRONEY. Would you have someone designate for the committee's benefit?

Mr. DURFEE. I referred to seats 6 and 7. This is peculiar numbering. Actually it is rows 6 and 7.

Mr. TANGUAY. That would be between this row of seats and this row of seats. There are two sets of seats forward of the lavatory. Between 6 and 7 is the area of explosion, the hole, and of course concentrated all through this area.

Senator MONRONEY. The red lines mark where you feel the first disintegration occurred?

Mr. TANGUAY. The first disintegration is in this area and then spread out.

The CHAIRMAN (Senator Magnuson). Other than in the seating part of the fuselage, what if any is underneath or in the vicinity or above that area in the airplane?

Mr. TANGUAY. Underneath the area would be the hydraulic system. I believe Mr. Pahl could answer that.

Mr. PAHL. Yes; that is the hydraulic compartment.

The CHAIRMAN. The hydraulic system for the landing gear?

Mr. PAHL. The accumulators and reservoir, and some of the other hydraulic system components.

Mr. DURFEE. The landing gear?

Mr. PAHL. For landing gear and flaps.

The CHAIRMAN. That would be the only machinery or equipment that would be underneath that area?

Mr. PAHL. Yes; there are, of course, electrical wires running through the area, as well as——

The CHAIRMAN. Running through the whole ship. What would be above that area?

Mr. PAHL. There is only the cabin lining, some air ducts, and some electrical wiring.

The CHAIRMAN. The wires that will run the length of the whole plane.

Thank you.

Mr. DURFEE. Are there any further questions about the diagram?

Senator BARTLETT. How messy was that disintegration?

Mr. TANGUAY. As I said before, the concentration was in this area here, which would be a hole approximately 3 feet in diameter. And then it spread out through this entire area here. But the actual hole through the floor was just in this little space here that is marked off in red.

Senator BARTLETT. What would cause it to spread?

Mr. TANGUAY. I suppose the explosion probably would do that.

Senator COTTON. It is the buffeting. After there is a hole made in the fuselage, then the buffeting of the air could spread it.

Mr. TANGUAY. That would do it. The concentration of the force would go through the hole and then bits and pieces flying around after that.

Senator BARTLETT. And disintegration would have continued had not the plane crashed. It would have been even a larger area had not the plane crashed.

Mr. TANGUAY. I doubt very much that it would have been much larger than it is right now.

The CHAIRMAN. Who was sitting in that seat?

Mr. DURFEE. Mr. Frank was sitting in this area.

The CHAIRMAN. Who?

Mr. DURFEE. Mr. Julian Frank.

Senator MONRONEY. Do you get that from the seating chart or because of the condition of the Frank body?

Mr. DURFEE. Do we have the seating chart?

Mr. TANGUAY. No; we do not have the seating chart. Because of the similarity in the explosion area, and the similarity of evidence in

Frank's body, we concluded that he must have been sitting in that area.

Senator MONRONEY. In other words that piece of the plane and the one body which was found separated from the others was in a position reasonably near. Then it would be assumed not from the documentary evidence of the seating chart, it would be assumed that as the pieces left the plane that the body evidently left it, too, and he would have had to have been in that near vicinity.

Mr. TANGUAY. Yes, sir.

Mr. DURFEE. Senator, I believe the very next paragraph of my statement covers that very point.

The CHAIRMAN. Excuse me.

Mr. DURFEE. We have shown a chart to demonstrate the place where the first disintegration, the general disintegration of this aircraft occurred, in the vicinity of rows 6 and 7, just about even with the front wing of the aircraft on the right hand side. Therefore the Board's Bureau of Safety, with the assistance of the Federal Bureau of Investigation, and the FAA and other agencies of the Government, which assisted us in our evaluation, is now prepared to say we have found evidence that a dynamite explosion, initiated electrically by a dry-cell battery, occurred within the aircraft cabin in the vicinity of the seat occupied by Julian Frank.

The Federal investigation of this accident is not complete. It is the Board's intention, however, to convene a public hearing at Wilmington on March 22, at 10 a.m , and at that time all pertinent evidence to finally determine the probable cause of this accident will be fully developed.

May I add, Mr. Chairman, that while the members of the staff accompanying me are ready to answer any pertinent questions, I do believe that these questions should be developed to the facts which we have given you a synopsis of.

The aspects of this entire investigation which relate to possible criminal charges are still in the process of investigation. Certainly in that area, criminal responsibility or anything of that character, which is primarily the responsibility of other agencies of the Government, I would request that I not be interrogated in this particular area.

Senator MONRONEY. Are you prepared to testify on those parts of the plane and the findings of the investigation from the parts of the aircraft and from the disintegration and things of that nature? You are not prepared to go into that part of the investigation now being conducted by the FBI?

Mr. DURFEE. So far as we have divulged facts as to what happened, we have coordinated this with the FBI and have their approval on the disclosure of the facts which we have produced here today.

Senator MONRONEY. You state very specifically and point out in your statement that you have found small pieces of steel wire, cloth fibers, and black deposits which later were determined to be manganese dioxide, a substance found in dry-cell batteries. You amplify that and come to the conclusion in the next to the last paragraph that—

We have found evidence that a dynamite explosion, initiated electrically by a dry-cell battery, occurred within the aircraft cabin in the vicinity of the seat occupied by Julian Frank.

You have identified both the battery evidence and the possibility of Mr. Julian Frank and the original disintegration of the plane being found in a position separate by some 20 miles from the balance of the bodies and the balance of the plane. You have mentioned the dynamite explosion, but you have not amplified how you arrived at the fact that it was a dynamite explosion.

Mr. DURFEE. Mr. Chairman, there were other chemical residuals found in addition to manganese dioxide, which is a part of the dry-cell battery. I think we found residuals also of nitrate chemicals, which are used in the manufacture of any dynamite as an explosive.

Senator MONRONEY. Earlier, however, we had testimony that because the body had been in the water for some 3 days, and salt water having a detergent action on residuals of common explosives, that there was no evidence from chemicals on the body that the evidence perhaps could be adduced from the steel wires and other things that were embedded in the body. But what has happened to identify this as a possible dynamite explosion or explosion of that nature?

Mr. DURFEE. The nitrate chemicals, which are component parts of dynamite, were found in areas of the aircraft itself, and some residual I believe was found in the air vents, the vent over the seat that one turns on or off to admit air. And I think in the areas of the aircraft in this vicinity.

Senator MONRONEY. Those were found by the CAB investigators?

Mr. DURFEE. Yes, sir.

Senator MONRONEY. And identified as such a residual accumulation as would have occurred from an explosion similar to dynamite or some such basis as that; is that correct?

Mr. DURFEE. Yes, sir.

Senator MONRONEY. And there is a positive chemical analysis identifying this as the residuals from that type of explosion?

Mr. DURFEE. The explosion I think is a positive conclusion of both the Board and the Federal Bureau of Investigation.

In fact, Mr. Chairman, it was the FBI which did the laboratory work which established the explosive residuals which were found in the aircraft by our investigators.

The CHAIRMAN. I do think, Mr. Chairman, again the record ought to be clear that we have originally asked the CAB for a report on this accident. They cooperated very fully. And then we asked them to keep us advised, and that is the reason they are here today. The conclusions, of course, will be made by them at a later date after the usual procedures are gone through.

Mr. DURFEE. Yes, sir.

Senator BARTLETT. One question only.

Is the Bureau of Safety of the opinion that the explosion originated at or about seats 6 and 7?

Mr. DURFEE. In that vicinity; yes, sir.

Senator BARTLETT. In that very close vicinity?

Mr. DURFEE. Yes, sir.

Senator BARTLETT. Thank you.

Senator MONRONEY. Senator Schoeppel?

Senator SCHOPPEL. I have no questions.

Senator MONRONEY. Senator Cotton?

Senator COTTON. The one means by which you identified your position——

Mr. DURFEE. I can say, Senator Bartlett, that we are of the opinion that the explosion occurred between rows 6 and 7.

Senator BARTLETT. Thank you.

Senator COTTON. And one of the factors leading to your determination or your opinion or conclusion that Julian Frank was seated at that point in the plane is the similarity of the particles or substances found within his body and the other objects in that locality in the plane?

Mr. DURFEE. That is one of the facts; yes, sir.

I think another fact is that the portions of the aircraft we believe left, were blown, at least forcibly were blown out of this side of the fuselage, and the portions of the seat and Mr. Frank's body were all found in the area of Kure Beach. All the rest of the wreckage was gathered 20 miles inland.

The CHAIRMAN. Mr. Chairman, one thing while you are here.

You and the Board and the members of this committee have been for some time quite concerned about the carrying of explosives or dangerous material aboard aircraft. You proposed legislation, I believe, 2 years ago, in which we made it a criminal offense to come aboard an aircraft with explosives or dangerous materials; which is now the law.

Regardless of this particular case, do you feel now that that is sufficient, or does the Board contemplate going into the matter further with a view of asking Congress for further legislation to tighten up or at least reduce to the minimum the possibility of anyone bringing at any time explosives or dangerous material aboard an aircraft?

Mr. DURFEE. There are several areas which we are exploring, Senator. The first one is, as you suggest, the possibility of further legislation imposing even more drastic penalties for bringing explosives on board an aircraft, even if a fatality does not result.

The second, I might say that we have had extensive discussion with the FAA, and General Quesada has called several conferences in which we have participated, with outstanding experts from all over the United States in all of the particular areas of scientific expertise involved. We have gone into the question of various types of surveillance and inspection of luggage and passengers boarding aircraft. We have gone into the question of impregnating explosives with radioactive isotopes so that they could be detected with something like a Geiger counter.

We have gone into the question of the peculiar types of psychotic individuals who are involved in these particular cases; specifically the two previous bomb explosions that we had, one in Longmont, Colo., in 1955, where I believe Mr. Graham insured his own mother for $35,000 and then put a bomb in her luggage; and the second air bomb explosion I believe was Daggett, Calif., in which a man took explosives and went into the lavatory and sat there lighting sheets of toilet paper until he burned his fingers, until he finally exploded the explosives and blew himself out through the side of the lavatory. In that case he was the only one killed.

These types, and the psychotic individuals, are the type of individual who would be suspected of this activity, either of committing

suicide himself, along with everyone else in the aircraft, or of killing someone else, presents a peculiar psychotic problem. I think we have had consultation with the top psychiatrists of the country as to what types of preventive action would be the best and most effective in dealing with this abnormal type of person.

We have made a study of the types of insurance that are available with the possibility of reducing this, as to whether or not this would have a perceptive effect. For example, it has been urged that the type of insurance machine in which you put quarters and insure up to $62,500 with one company, that that should be discouraged.

I would say, Senator, that we have, particularly since this last accident, been pretty busy with some pretty exhaustive analyses and a thorough study.

I must say I think General Quesada has taken the lead. We have cooperated with the other agencies of Government. We have had conferences with top experts who have been called in from all over the United States in every field possible.

I am not prepared at this time—I have not come prepared—to go into detail because I don't think we are in a position to make any firm recommendations. It is a pretty difficult subject in every area.

The CHAIRMAN. It poses a very difficult problem, even getting down to the question of liberties and the problem of detection, the problem of new methods of detecting dangerous materials. I can see that it would have to be a very exhaustive field. But I do think the traveling public will feel reassured, particularly those traveling in airplanes—it could be done on railroad trains or anyplace else—to know that the CAB and General Quesada and the FAA are really getting into this with the hope that we might have some method of detection, screening, or whatever it may be to reduce the possibility of these things to a minimum. There are several ways, I suppose. Maybe you will have to have a combination of a lot of them rather than one thing.

Mr. DURFEE. It is my belief, and I believe General Quesada shares this opinion, and most of us in this field, despite the necessity for improved methods in every area that I discussed, we still believe that the most effective deterrent in this area is what I think we are doing right now: a prompt, thoroughly scientific analysis and detection of the cause of aircraft accidents, including accidents of this type.

And then, through the other agencies of the Government, prompt apprehension and conviction of the persons responsible, if they are still alive.

It is my belief that this offers the best deterrent, and I think, Senator, possibly we magnify this beyond its true perspective, I would like to again repeat some of the figures we gave you at the last hearing as to the incidence of this type, up to the time these two cases occurred. For the past 10 years we have had only two fatal aircraft accidents that were the result of bombings, the one at Daggett and the one at Longmont, which I have recited, resulting in a total of 45 fatalities.

The CHAIRMAN. But those are cases of known bombings.

Mr. DURFEE. Yes, sir.

Senator MONRONEY. There are very few cases of accidents that have not been identifiable either as to the other causes or to such a cause as bombing of an airplane. I think there are probably less than one

or two other cases that are still marked unsolved in the whole great record that the CAB investigators have established. Is that not correct? I think there is one in the Pacific and two at the present in the gulf that are still——

Mr. DURFEE. We have four cases, Senator. There is one in the vicinity of Benton Harbor, Mich., in which the aircraft apparently wound up in Lake Michigan. It happened on June 23, 1950. One east of Wake Island, on July 12, 1953. One near Pensacola, Fla., on April 2, 1955. One in the Pacific Ocean, Pan-Am, November 9, 1957. In each of these cases the cause of the accident remains undetermined because of the inability to find anything to arrive at a reconstruction of the accident.

The CHAIRMAN. I appreciate that in most of them you have a pretty good idea of what happened, in a general way. There are those that are unsolved. It is true, Mr. Chairman, that what you are doing—and if it is done as well as I am sure you intend to do it in a case such as this one—it will be a great deterrent to the possibility of things such as we mentioned happening, where they are doing it for gain, because obviously the gain would disappear if it is proven by the work you have done that this is the reason for it. The second big problem, I suppose, is those who do it just to do it. That poses a very serious problem for you people, I am sure, and one that frightens the traveling public.

I am sure that what you mean to say and what you have said in effect is that you are conscious of this problem and that you are doing everything that is possible to do with reference to the new methods and new ways of getting at this.

Mr. DURFEE. Yes, sir.

Senator MONRONEY. Did you have any further questions on this particular accident?

Mr. DURFEE. Senator, for the record, to put this in its true perspective, I think we should point out that back over the last 10-year period the passenger fatality rate in the United States for 100 million passenger-miles flown is presently 0.55 percent per 100 million miles—0.55. Fatality rate per 100 million passenger-miles from the two bomb accidents that I have referred to works out with the same number of total passengers, passenger-miles, 0.016.

Senator MONRONEY. Are there any further questions on the North Carolina crash?

(No response.)

Senator MONRONEY. While you are here I would like to have you or some member of your staff bring the committee up to date on what is being done in the search for the interline exchange plane involved in the accident that occurred off New Orleans where a Delta plane operated I think in combination with National was lost in the Gulf of Mexico and in which Dr. Speer's name has been prominently mentioned in the press. He was believed to have been lost in the plane and later was found and arrested by the FBI. I know you have testified before the committee that you thought you had located the fuselage and the airframe by sonar, but in further very difficult search it was found that this was not the airframe. I wonder what further action is being taken to locate this very valuable and almost necessary bit of evidence if that accident is to be solved.

Mr. DURFEE. I believe you are referring to the crash of the DC-7, November 15, 1959, on the flight from Miami to New Orleans.

Senator MONRONEY. That is correct.

Mr. DURFEE. I think we have already produced considerable information for this committee as to the investigation of this accident, the prime difficulty being our inability up to this time to recover any of the wreckage of this aircraft, because of the fact that it is in the Gulf of Mexico.

The last sonar contact which was made by the Navy was found to be a vessel, a wrecked vessel, 29 degrees, 12.3 minutes north and 8 degrees, 57.3 minutes east. This was on February 6, 1960. In this operation in which I believe we finally brought up some chain and plates of this vessel, we did find on the grapnel, which they were dragging, some dark blue paint, from which our people reached the conclusion that this paint was one highly similar to the paint which was on this particular aircraft; that we believed from this sonar contact of the wrecked vessel that perhaps we could also locate the aircraft in the same area. We therefore requested the Navy on November 16 to expand the search position where this vessel was found until this aircraft wreckage is located, if possible, using whatever special equipment they would consider necessary.

We have been informed just today that they have some special equipment, special techniques, I think in the area of television and sonar, which, however, is classified information. In fact, we don't know too much about it ourselves. But this is equipment which they propose to use, which will give them further assistance in locating this wreckage.

A specially equipped vessel is en route from Norfolk to Panama City where they will place more special equipment on board. They will resume operations on the 2d of March. Also a minesweeper and a rescue submarine. That is about all that I can report.

Senator MONRONEY. As I understand, this is a most difficult search because it is in the vicinity of the Mississippi Delta. Where there is a very deep siltation and a gray bottom, as I understand it, and the depth of the water varies from 150 feet to 3,000 feet. Consequently it will require either some very special equipment or sonar and underwater television and other things that may be able to be put together, or some lucky finding of shrimp fishermen or someone else who might happen to run across it in their trolling, is that correct?

Mr. DURFEE. That is correct, Senator.

If I am advised correctly, the Navy divers that have been working on this have been working at extreme depths and under pretty stormy conditions. It is very difficult to attempt this type of search by deep sea divers, part of it being because of the excessive silting of water in this vicinity, and also the extreme depth.

Senator MONRONEY. There is very little visibility at the bottom, is that correct?

Mr. DURFEE. Yes, sir.

Senator MONRONEY. You are getting complete cooperation from the Navy on this, are you not?

Mr. DURFEE. Yes, sir.

Senator MONRONEY. This brings, however, another question, and I know that the CAB is concerned with it, and that is the lack of any

funds given to the Accident Investigation Division for unusual types of accidents where the recovery is most important to the final ascertaining of the cause of the airplane accident. As I understand it, there are no funds that you have in sufficient amount that would provide any outside search or any special efforts other than that which is cooperatively given to you by other arms of the Federal Government.

Mr. DURFEE. That is correct.

Senator MONRONEY. Or by private industry. I think once in a while airlines, or in one case, in the Pensacola crash I believe it was the Air Line Pilots Association that financed the recovery of that airplane.

Mr. DURFEE. That is correct, Senator. We have no independent funds of our own. We have to rely on outside sources for any specifically highly specialized search or analysis.

Senator MONRONEY. Don't you think it would be helpful to the CAB if, in the consideration of your necessary funds for the operation of this very vital department of the CAB on air safety, that some independent funds of your own could be available to you in appropriation bills so that you might be able to supplement these with efforts where the Federal Government or other agencies of government cannot give you complete cooperation without interfering with their own budget requirements?

Mr. DURFEE. The Board and the Bureau of Air Safety both agreed, Senator, that this would be highly desirable.

The CHAIRMAN. Before we go on any further on this: I handle your appropriation, do I not?

Mr. DURFEE. Yes, sir.

The CHAIRMAN. Did you ever ask for anything like this?

Mr. DURFEE. Not specifically.

The CHAIRMAN. All right.

Senator MONRONEY. I am just saying that these two accidents point this up.

The CHAIRMAN. I handle his appropriation.

Mr. DURFEE. The chairman of the committee never asked me to ask for it.

The CHAIRMAN. Did you ever ask the Budget for it?

Mr. DURFEE. Not that I recall; not specifically.

The CHAIRMAN. We have given them every bit of money they have ever asked for. I am no expert on what they need unless they come and ask for it, on accident investigations. The House cut——

Mr. DURFEE. Senator, let me get the record clear. Between the Bureau of the Budget, the Congress, and committees of the House and the committees of the Senate, and the final vote on our appropriation, we have not always got all that we asked for safety investigations.

The CHAIRMAN. I am glad you put the Bureau of the Budget first, because——

Mr. DURFEE. I am confining my——

The CHAIRMAN. Haven't I in all the years that I have been handling the CAB appropriations, and you have been on the Board, given you what the Budget asked for in this field? I mean what the Budget approved? Isn't that correct?

Mr. DURFEE. In the area of safety investigation?

The CHAIRMAN. Yes. Isn't that correct?

Or, if you want to answer it more accurately, within 98 percent or 99 percent?

Mr. DURFEE. I would say 99; maybe 100.

The CHAIRMAN. All right. Ninety-nine or maybe a hundred.

Senator MONRONEY. Certainly no one is criticizing what the Appropriations Committee has done. We realize that sometimes what an agency asks for from the Bureau of the Budget is not the amount which they are privileged to ask for before a congressional committee. But this does focus a very important thing, I think, on the need for some independent funds. For example, if you had a thousand or two thousand dollars, which you could offer as a reward for the location of this airframe somewhere in the delta of the gulf, to shrimp fishermen or others who are in that area, they might be able to come up with some information in their daily work that would be of extreme value to you in determining more definitely the cause of accidents lost offshore.

Mr. DURFEE. Yes, sir.

The CHAIRMAN. What you are talking about, what the Senator from Oklahoma is talking about, you try and anticipate the best way you can down there what is your normal load over the year. You go to the Budget and ask for that amount, or when you come to Congress. I think what the Senator from Oklahoma is suggesting is that you ought to have some fund—it wouldn't need to be too much—which would be a special fund set aside to use in a particular case where the emergency would arise. That wouldn't entail much funds. In many years you wouldn't probably use it at all; but it would be there for your use where the circumstances were extraordinary.

Mr. DURFEE. I think, Senator, you must realize that each year these aircraft are flying at higher speeds, higher altitudes. I think we are confident that our accident rate per 100 million passenger miles is going to continue to decline, and that when we have accidents they are going to be more difficult to determine the cause by reassembling the wreckage and trying to reconstruct what happened. This type of assistance that you are talking about in some cases might be an immediate need for these funds without having to wait for somebody to cooperate with you, and would be extremely valuable.

Senator MONRONEY. There could be a revolving fund there for use when you need it.

The CHAIRMAN. I am having you up here in about 3 weeks.

Mr. DURFEE. I understand.

The CHAIRMAN. This is not an invitation for pin money, but it is an invitation to present a plan. I thoroughly agree with you that this is going to increase the amount of complex and technical work that you are going to have to do as these airplanes become more complicated and bigger.

Senator MONRONEY. Senator Thurmond?

Senator THURMOND. I have no questions.

Senator MONRONEY. Senator Bartlett?

Senator BARTLETT. I have nothing.

Senator MONRONEY. Mr. Chairman?

The CHAIRMAN. I have nothing further.

Senator MONRONEY. Thank you, Mr. Chairman, and your staff for a most searching job and for bringing this committee and the public up to date on those things which you have found and are able to identify as probable causal factors of this accident.

The committee will stand in adjournment.

(Whereupon, at 2:57 p.m., the hearing in the above matter was adjourned.)

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